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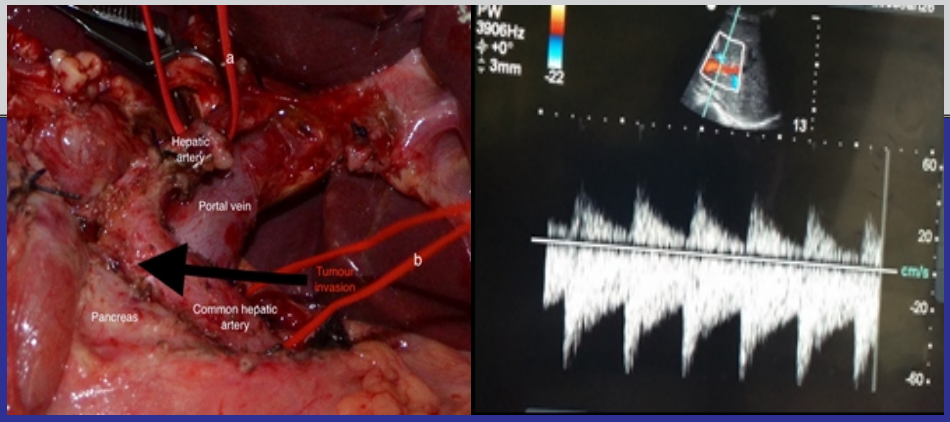

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- Acute kidney injury during sepsis
- Medical negligence
- Flexible sigmoidoscopy in patients with a lump at anus
- Risk factors associated with fall among elderly patients

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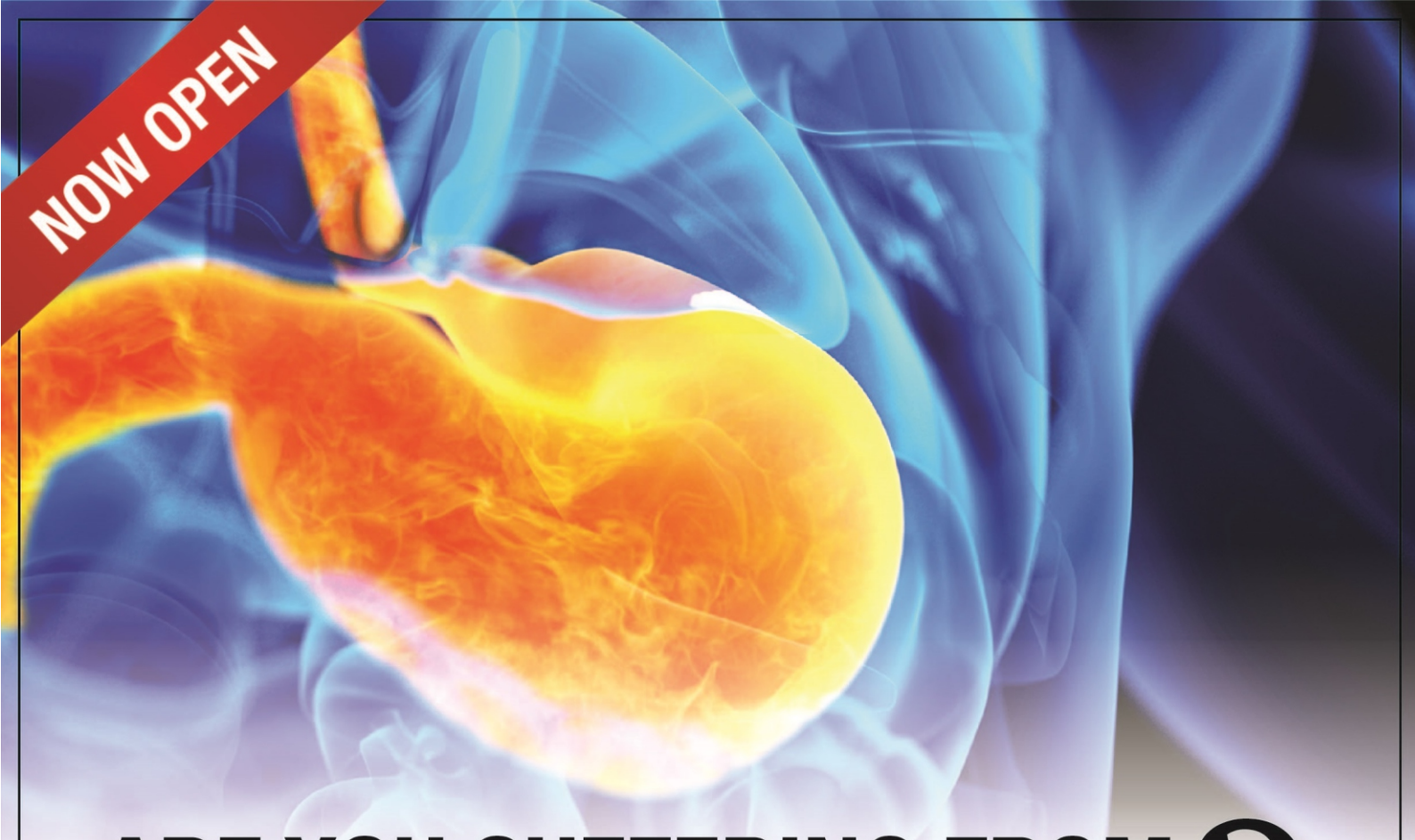

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Mission: "To reach the highest standard of scientific surgical practice by dissemination of high quality scientific information and to foster and promote the growth of scientific surgery in Sri Lanka and in the region"

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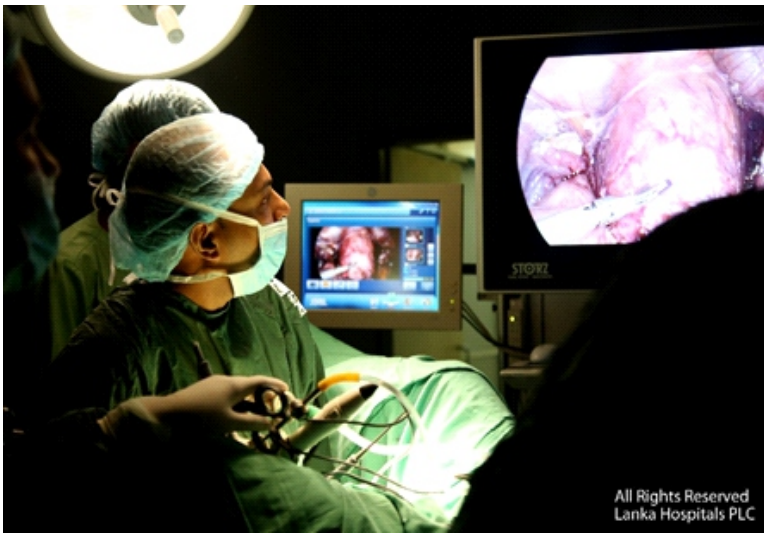
Lanka Hospitals surgical model expands to international standards

Lanka Hospitals, the multi award winning internationally accredited hospital located in the heart of Colombo is fortified with the most technologically advanced equipment and a well-respected bevy of consultants and medical staff with international exposure and experience. With its recent quality additions; Medical Travel Quality Association Certification (MTQUA), and the Joint Commission International (JCI -USA) Lanka Hospitals is duly bestowed with the epithet 'The most accredited hospital in Sri Lanka'. The MTQUA and JCIA are International tokens that symbolize its continuous quality, sustained delivery of maximum patient safety and superior care.

Holding true to its international standards, Lanka Hospitals through the years has amassed a wealth of technical expertise, and resources in relation to surgical care, complimenting with its tertiary care facilities; so that patients can undergo all medical procedures under one roof.



Lanka Hospitals is one of the few healthcare providers in Sri Lanka to undertake surgical care for patients of all ages from pediatric to geriatric. The hospital specializes in procedures from conventional to minimal invasive and offers all major surgical spectrums from Neurosurgical (spinal and brain) Orthopedic (TKR, Hip replacements, acute poly trauma), general and GE surgery (Laparotomies, liver resections, thyroidectomies, wheepls, APRs) to Pediatric, Oncology surgeries, Cardiac, ENT, OMF and Cosmetic.

The 27-bed surgical ward established on the 8th floor of the hospital has shown a tremendous growth since it's commissioning a few years ago and is currently being patronized by eminent surgeons in their fields of specialty. The dedicated surgical ward is facilitated by a 4-bed High Dependency Unit (HDU).

All Operating theaters have been consistently upgraded with modern cutting edge technology and instrumentation to facilitate the surgeons and for the safety of the patients. With Lanka Hospitals focusing on Day Care surgeries, emergency mini theatre of the hospital is being upgraded to suit a broader spectrum of surgeries.

Lanka Hospitals surgical care, on par with international quality standards is complete with some of the latest technological additions since 2013/2014.

- 2 high end laparoscopic systems: Karl Storz and the latest Olympus systems. Since this upgrade, the hospital has seen a 100% growth in laparoscopic surgeries.
- Urology: Laser system has been upgraded to 30 Watt, while the Olympus Resectoscope is being upgraded to the latest edition.
- Neurology: the hospital possesses Sri Lanka's first Neuro navigation system with 3DC arm for precision and efficiency. Since the introduction of this system, there has been a 250% increase in brain surgeries and no post-operative neurosurgical mortalities in Lanka Hospitals.
- Neurology: Procurement of latest Budde Halo Neuro Retractor system for ease of performance and precision. Lanka Hospitals is also the only private hospital in the country that has a 6- member- strong mix of visiting and resident consultant neuro surgeons to attend to neuro surgeries around the clock within the premises.
- the latest self-retaining abdominal retractor systems.
- the latest ultra sound scan with intra operative probes for liver surgeries.

· ultrasonic dissector system.
· Oncology/ Women's Wellness Centre/ Gynaecology – The Sentinel node Gamma Probe minimizes the post-operative complications of breast surgery and some Gynaecological surgeries by preventing unnecessary removal of unaffected lymph nodes.
· ENT – The KTP Laser or the Solid State Laser used mainly for ENT and some Gynecological procedures that reduced bleeding and operating time and makes surgeries more effective.

GE Center: Lanka Hospitals performs liver surgeries every month and the commissioning of the Gastroenterology Center of Excellence saw the establishment of a dedicated GE facility with multiple subspecialties. The GE Center of Lanka Hospitals encompasses diagnostic and therapeutic procedures under one single facility and is unprecedented in its technology and expertise with additions such as

· Endoscopic Ultrasonic Scan (EUS)
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· facilities to perform procedures such as Endoscopic Retrograde Cholongio Pancreatography (ERCP) in the same facility without shifting to Operation theaters
· PH Manometry with impendance studies

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The role of flexible sigmoidoscopy in the evaluation of patients presenting with a lump at anus

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Key words: Flexible sigmoidoscopy; lump at anus; proctoscopy

Abstract

Objective

In certain units, flexible sigmoidoscopy is routinely done in patients presenting with a lump at anus, even if an obvious cause is seen on proctoscopy. This is to look for primary causes and to detect other additional lesions. However, routine flexible sigmoidoscopy has led to many negative sigmoidoscopies.

Materials and methods

A retrospective analysis of 556 consecutive patients presenting with lump at anus with or without painless bleeding per rectum over a period of 9 years was carried out. Those with additional symptoms such as alteration of bowel habits and abdominal pain were not included. All the patients underwent a digital rectal examination, proctoscopy and flexible sigmoidoscopy.

Results

Median age at presentation was 49 years (range16-89) (Male: female = 1.3:1). Of those, 175 (31.47%) were aged 40 years or less. The majority (N = 361, 64.9%) had haemorrhoids only. In the majority (90.83%), apart from lesions identified by clinical examination and proctoscopy no additional lesions could be identified. Of those aged 40 years or less, 1 patient (0.6%) had a benign polyp while in those aged more than 40 years, 5.2% had benign polyps, and 1 (0.3%) patient had carcinoma. Only 2 patients (1.2%) aged less than 40 had additional lesions, which were benign.

Conclusion

Our study shows that flexible sigmoidoscopy was of some value mainly in those over the age of 40 years. Those who are aged 40 years or less and who are diagnosed to have a lesion on clinical examination and proctoscopy may be treated for the same without further endoscopy.

Introduction

A lump at anus is a common presentation in the general practice [1] and are frequently referred to a surgical unit for further evaluation. Common causes for this presentation are haemorrhoids, chronic fissure, anal tags, rectal prolapse, condylomata and anal cancer [2].

The presence of a lump at anus narrows down the differential diagnosis because the pathology is most likely to be very distal. Also in the majority of the patients presenting with a lump at anus, a diagnosis can be made by clinical examination and proctoscopy.

Flexible sigmoidoscopy is routinely done in some units in both young (i.e. 40 years or less) and older patients (i.e. more than 40 years) presenting with a lump at anus, even if an obvious cause is seen on proctoscopy. This is to exclude primary causes and to detect other additional lesions. However, routine flexible sigmoidoscopy to all patients have led to many normal sigmoidoscopies.

It is also important to note that when there are primary causes, it is unusual to present without additional symptoms such as alteration of bowel habits and tenesmus. However, it is also important not to miss them as the primary cause may be sinister. Whether routine flexible sigmoidoscopy should be done in all patients presenting with a lump at anus without other alarming symptoms is debatable and especially the cost effectiveness in a resource limited setting is controversial.

Studies have been done to assess the yield of flexible sigmoidoscopy in patients presenting with per-rectal bleeding and other colorectal symptoms [3, 4]. However, there are no published data particularly on the yield of flexible sigmoidoscopy in those presenting with a lump at anus, with or without fresh per rectal bleeding.

Therefore, this study aims to identify the yield of flexible sigmoidoscopy in the evaluation of those presenting with a lump at anus without additional alarming symptoms and also

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to compare the effectiveness in young and older patients.

Materials and methods

A retrospective analysis of patients presenting with a lump at anus with or without painless fresh per rectal bleeding who underwent flexible sigmoidoscopy in the Professorial Surgical Unit, Faculty of Medicine, University of Colombo from January 2007 to April 2015 was done. Reports of all patients who were older than 16 years were analysed. Those who had other bowel symptoms such as alteration of bowel habit, abdominal pain, passage of mucus, tenesmus, loss of weight and loss of appetite were excluded. Those who had a past history of colorectal malignancies, inflammatory bowel disease or a family history of familial adenomatous polyposis or hereditary non-polyposis colorectal cancer were also excluded from this analysis. All those who had a palpable tumour at digital rectal examination were also excluded.

A total of 556 patients were selected for analysis. All those patients had a "lump at anus" as the primary complaint. All patients underwent a digital rectal examination, proctoscopy and flexible sigmoidoscopy which were performed by colorectal or general surgeons or by surgical trainees under supervision at the endoscopy unit. A single phosphate enema was administered 45 – 60 minutes before flexible sigmoidoscopy in all patients. Patients were positioned in the left lateral position. The procedure was done with a standard 60-cm fibre optic flexible sigmoidoscope, Details related to the procedure such as type of sedation (if used), the part of the bowel visualised, abnormalities seen, adequacy of preparation and patient details were recorded in a computer database.

Statistical analysis was done using SPSS 20.0 statistical software (SPSS Inc., USA). Univariate analysis was done and results of categorical variables were expressed as frequencies and proportions.

Results

Flexible sigmoidoscopy was performed in 314 (56.5%) males and 242 (43.5%) females. Of those, 175(31.47%) were aged 40 years or less. The median age of the participants was 49 years (range 16-89). Complete sigmoidoscopy was considered as intubation up to the splenic flexure. This was achieved in 548 patients. The main reason for failure was poor bowel preparation. There were no complications encountered during these procedures.

The majority of the patients had haemorrhoids only (n = 361, 64.9%). Skin tags and chronic anal fissures were the only abnormalities detected in 13 (2.3%) and 9 (1.6%) patients respectively. Normal findings were seen on clinical examination, proctoscopy and flexible sigmoidoscopy in 87 patients (15.6%). Polyps, inflammatory lesions, diverticula, were the findings in 14 (2.5%), 7 (1.3%) and 4 (0.07%) patients respectively. On endoscopic examination, the presence of ulcers, oedema, erythema, granular appearance of mucosa were considered as inflammatory lesions. Other rare findings included, vascular malformations, perianal haematoma, and fistula-in-ano in 9 patients (1.7%).

In 51 (9.17%) patients additional lesions other than those detected by clinical examination and proctoscopy were identified.

Other pathologies in addition to the lump were found in 17 patients only (3.05%). All those patients had haemorrhoids in addition to polyps (n = 8, 1.5%), ulcer or inflammatory lesions (n = 3, 0.5%) and diverticular (n = 5, 0.9%) respectively. One patient had a suspicious mucosal bulging with intact mucosa.

Almost all (n = 15) of those with additional lesions were aged more than 40 years. One patient less than 40 years had an additional lesion which was an adenomatous polyp and another patient had an ulcer as an additional finding, in the rectosigmoid junction which was histologically unremarkable.

Total number of patients detected to have polyps was 22 (4.0%, isolated findings 14 and 8 patients had polyps in addition to haemorrhoids). The majority of the polyps were adenomatous polyps (n = 15, 68.1%). Of those, 12 had low grade dysplasia and 2 had high grade dysplasia. One polyp was histologically malignant, which was a moderately differentiated adenocarcinoma, infiltrating the muscularis mucosa [Table 1].

	Number	Percentage (%)
Tubular adenoma with low grade dysplasia	12	54.5%
Tubular adenoma with high grade dysplasia	2	9.1%
Serrated adenoma	1	4.5%
Adenocarcinoma –moderately differentiated	1	4.5%
Unremarkable	2	9.1%
Fibroepithelial polyp	2	9.1%
Hyperplastic polyp	2	9.1%

Table 1. Histological findings of polyps found in flexible sigmoidoscopy in the total study participants

All (n=9) inflammatory lesion (ulcers, erythematous areas) were histologically unremarkable.

All isolated benign polyps were found only in those aged more than 40 years. Important findings including lesions in addition to the lump were noted in 2.9% of those aged 40 years or less and 12.8% of those ages more than 40 years. The

	Age 40 years or less		Age more than 40 years	
	N	%	N	%
Haemorrhoids	119	68.0%	242	63.5%
Other benign lesions	22	12.6%	26	6.8%
No abnormalities detected	29	16.6%	64	16.8%
Benign Polyp	0	0.0%	13	3.4%
Inflammatory lesions	1	0.6%	6	1.6%
Diverticula	2	1.1%	15	3.9%
Adenocarcinoma	0	0.0%	1	0.3%
Haemorrhoids + benign polyp	1	0.6%	7	1.8%
Haemorrohoids + inflammatory lesions	1	0.6%	2	0.5%
Haemorrhoids + diverticula	0	0.0%	5	1.3%

Table 2. Comparison between age and the types of lesions found during flexible sigmoidoscopy

comparison with type of lesions and age is given in Table 2.

Discussion

Lump at anus is a common clinical problem. Among surgical units, there is currently no consensus whether a flexible sigmoidoscopy is necessary if an obvious aetiology is identified with clinical examination and proctoscopy. Some units perform routine flexible sigmoidoscopy in all age groups even if a cause has been detected.

In this study, the majority had haemorrhoids as the only cause for the lump at anus (n = 361, 64.9%). For diagnosis, the majority required clinical examination and proctoscopy. Only 51 (9.17%) patients were found to have additional lesions other than those detected by clinical examination and proctoscopy. Additional findings were seen only in 9.17% of patients out of which 3.05% had additional lesions. Out of those, the majority seemed to be an incidental finding rather than a cause for the lump at anus. Total yield of flexible sigmoidoscopy for polyps was 3.95% and malignancy was 0.17%.

Similar studies have been done to evaluate the yield of flexible sigmoidoscopy in those who presented with per rectal bleeding [3, 5, 6].They showed a considerably higher yield of both benign and malignant lesions. A study done in 337 patients aged more than 40 years who presented with frank rectal bleeding showed that 9.1% had cancers and 10.3% had polyps [6].

Similarly, an analysis of sigmoidoscopy findings in those who presented due to per rectal bleeding showed that 7.7% had adenomatous polyps and 1.2% of those aged more than 40 years had a malignancy. However, our study did not find any malignant lesions in those who were aged less than 40 years [5]. In our study, thus the diagnostic yield of polyps was 4.0% (n = 22) and one patient (0.18%) had a histologically malignant polyp.

Therefore, the yield of polyps and malignancies was considerably less in our study where the presentation was a lump at anus with or without fresh per rectal bleeding. This may be due to the differences in the presenting symptoms in our patients compared to the above studies.

It is important to note that all isolated polyps detected were seen in those aged more than 40 years. Furthermore, only 1.2% (n = 2) of those aged 40 years or less had additional findings which were benign. No coexisting malignant lesions were identified in this analysis. Only (0.3%) isolated malignant lesion found was in a patient aged 55.

Commissioning guide for rectal bleeding, 2013 [7] states that basic clinical history, examination and proctoscopy is sufficient for young patients without any alarming symptoms. Older patients and those with alarming symptoms such as alteration of bowel habits, abdominal mass, anaemic symptoms, loss of appetite and loss of weight and strong family history of malignancy will require further endoscopy for evaluation. Similarly in our study, most patients required clinical assessment with proctoscopy for diagnosis. However, evidence based guidelines are not available for our population for patients presenting with lump at anus or rectal bleeding. Therefore, further studies are required. In addition, the incidence of colorectal cancer is increasing in the younger population over the past few decades [8]. It is important not to miss cancers in young patients. Therefore, a good clinical assessment with history, physical examination and proctoscopy in mandatory in all patients.

Routine flexible sigmoidoscopies in all patients imposes higher cost, especially in a low resource setting like in Sri Lanka and may also cause unnecessary discomfort to patients. Since the yield of additional lesions were considerably low in those who were 40 years or less, it may be possible to treat those who are less than 40 years and who are diagnosed to have a lesion on clinical examination and proctoscopy, for the same without further endoscopy.

Conclusion

Routine flexible sigmoidoscopy for evaluation of a lump at anus without alarming symptoms may not be necessary for all patients as it may impose higher cost and unnecessary patient discomfort. In this study, flexible sigmoidoscopy was a valuable initial investigation mainly for patients older than 40

years presenting with a lump at anus. It may be possible to treat those who are less than 40 years and who are diagnosed to have a lesion on clinical examination and proctoscopy without subjecting them to sigmoidoscopy.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

References

1. Daniel WJ. Anorectal pain, bleeding and lumps. *Australian family physician*. 2010;39(6):376-81.
2. Wolff BG, American Society of Colon and Rectal Surgeons., R2 Library (Online service). The ASCRS textbook of colon and rectal surgery. New York: Springer,; 2007.
   Available from:
   http://catalog.himmelfarb.gwu.edu/iii/encore/record/C__Rb1578709
   http://proxygw.wrlc.org/login?url=http://www.R2Library.com/marc_frame.aspx?ResourceID=545.
   https://doi.org/10.1007/978-0-387-36374-5
3. Mathew J, Shankar P, Aldean IM. Audit on flexible sigmoidoscopy for rectal bleeding in a district general hospital: are we over-loading the resources? *Postgraduate medical journal*. 2004;80(939):38-40. https://doi.org/10.1136/pmj.2003.008284
4. Papagrigoriadis S, Arunkumar I, Koreli A, Corbett WA. Evaluation of flexible sigmoidoscopy as an investigation for "left sided" colorectal symptoms. *Postgraduate medical journal*. 2004;80(940):104-6. https://doi.org/10.1136/pmj.2003.008540
5. Choi HK, Law WL, Chu KW. The value of flexible sigmoidoscopy for patients with bright red rectal bleeding. *Hong Kong medical journal* = Xianggang yi xue za zhi / Hong Kong Academy of Medicine. 2003;9(3):171-4.
6. Cheung PS, Wong SK, Boey J, Lai CK. Frank rectal bleeding: a prospective study of causes in patients over the age of 40. *Postgraduate medical journal*. 1988;64(751):364-8. https://doi.org/10.1136/pgmj.64.751.364
7. The Royal College of Surgeons of England. Commissioning guide for rectal bleeding, 2013. Available at: https://www.rcseng.ac.uk/library-and-publications/college-publications/docs/rectal-bleeding-guide/
8. O'Connell JB, Maggard MA, Liu JH, Etzioni DA. Rates of colon and rectal cancers are increasing in young adults. *The American surgeon*. 2003;69(10):866

SCIENTIFIC ARTICLE

Characteristics of the elderly patients admitted to surgical casualty due to falls: a study from northern Sri Lanka.

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Key words: falls; elderly

Introduction

Sri Lanka has a rapidly aging population with 22% of Sri Lankans expected to be over 60 years by 2030 [1]. The Northern Province has not been studied in detail in the recent past. However it could be expected that the situation is the same here. The elderly here are further disadvantaged by the fact that most of the offspring have left the province in search of greener pastures to other countries or other parts of Sri Lanka leaving the elderly population more vulnerable.

Falls are an important cause of disability and death among elders. The WHO Global Reports on falls prevention in elderly illustrates that 28 – 35% of elders over 65 years and 32 – 42% of them over 70 years fall annually[2]. Falls lead to physical injuries and restrict activity. They are among the principal causes of morbidity and lead to hospital admissions in the elderly. Thirty percent of people aged 65 years and above living in the community fall at least once per year and this proportion increases with age [3, 4]. About 40% of all serious fall injuries among the elderly including fractures, joint dislocation and head trauma resulted in hospital admissions. Psychological trauma in particular the fear of falling leads to self-limitation in physical activity and consequently loss of independence.

Falls occur due to multiple causes, which may be extrinsic, intrinsic or due to environmental factors. The most important intrinsic factors of falls are decreased mobility, cognitive impairment, use of multiple medications, depression, urinary incontinence, cerebro vascular disease, postural drop in blood pressure, dizziness, fear of falling, impaired visual acuity and a history of falls in the past. Many of these factors can be prevented and can be effective in reducing recurrent falls.

Information on falls in the elderly in Sri Lanka is sparse and there are no studies from the Northern Province of the country. A study carried out in the Colombo and its suburbs based on hospital data showed that 23% of the elderly (over 65 years) fell in a year [5].

This study was conducted to identify the characteristics of the elderly patients admitted to surgical casualty due to falls at the Teaching Hospital Jaffna, the only tertiary care centre in northern Sri Lanka.

Materials and methods

This is a cross sectional descriptive study, was conducted for a period of 3 consecutive months from April 2012. All patients above the age of 60 years admitted to the surgical casualty at the Teaching Hospital Jaffna with a fall during the study period were recruited to the study. Those admitted with falls following a road traffic accident or when the definitions applied for falls were not met were excluded from the study. Data was collected from all subjects using an interviewer administered questionnaire.

For purposes of this study a fall was defined as an event when a person comes to rest unintentionally on the ground or other lower level, without the influence of any extrinsic force (e.g. pushed down by somebody, knocked down by a car) [2,6]. Memory impairment was assessed using difficulty with 4 questions of the Alzheimer's Questionnaire (AQ) based on a study conducted by Michael Malek-Ahmadi et al [7].

The four questions used were,

1. Does the patient repeat questions/ statements in the same day?
2. Does the patient have trouble remembering the date, year and time?
3. Does the patient have difficulty managing finances?
4. Does the patient have a decreased sense of direction?

Each question was given a score of 1 with a total score of 4. The independence in activities of daily living was estimated using the Katz Index of Independence in Activities of Daily Living (ADL) and was score from 0 to 6. An independent patient had a score of 6 and a very dependent patient had a score of 0.

Data was entered and analysed using the Statistical Package for Social Studies.

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Results

A total of 100 consecutive patients presented to the Surgical Casualty of the Teaching Hospital Jaffna during the study period. Of these 39 were males and 61 were females.

A history of a fall within the past 1 year was present in 57. Of the fifty nine with chronic illness 34 had a cardiovascular disease, 6 a respiratory disease, 34 diabetes mellitus, 2 neurological illness and 15 had arthritis. Seventeen had 2 diseases and 8 had 3 or more co morbidities. Cardiovascular disease and diabetes mellitus were the more significant co-morbidities compared to neurological illness and arthritis.

Age	No
60 – 69	26
70 – 79	40
80 - 89	28
>= 90	6
Total	100

Table 1. Age distribution

With family	79
Alone	14
At elders home	7
Total	100

Table 2. Living status

Of the 56 patients on regular medication 35 were on antihypertensive, 1 on antidepressants, 12 on diuretics, 1 on an antiarrhythmic drug and 34 on drugs for diabetes mellitus and 7 were on drugs for other conditions. None were on sedative drugs. Nine were on two medications while 12 were on 3 or more types of medication. Antihypertensive and antidiabetic medications were the main factors when considering medications.

Sixty patients reported that they had a fear of falling; 34 had some degree of visual impairment; 54 had fainting attacks, dizziness or vertigo and 26 had some degree of difficulty in walking.

78 patients had no memory impairment, while 22 had some degree of memory impairment. Memory impairment was assessed based on the difficulty of 4 questions of the AQ. Of the 22 with memory impairment 4 scored 3, 5 scored 2, 4 scored 1 and 10 scored 0.

Activities of daily living of these patients were determined using the Katz Index of Independence in Activities of Daily Living. Ninety two of the 100 patients had a score of 6 (complete independence), 1 scored 5, 1 scored 3. Five scored 1 and 1 scored 0 indicating that they were dependent on others for their activities of daily living. Interestingly more than 90% are completely independent.

Environmental factors included inadequate light in 8; slippery surfaces in 40; unsafe staircases in 2 and cracked floor in 7. 43 did not report any environmental factors. Twenty-seven had been using walking assistance devices and 39 had been using footwear when they had the fall. Slippery surface was identified as the major environmental factor.

Within home	**64**
When standing	17
Rising from the chair	13
In the bathroom	14
In the toilet	08
Climbing up/down the stairs	14
Garden	**21**
Climbing up/down stairs	04
When standing	09
In side garden	05
Outside home	**15**
On the road	09
In public place	04
Getting out the car	02

Table 3. Place of fall

Discussion

More females (61%) had falls than males (39%) and this is statistically significant. This may be due to the fact that females are more prone to fractures due to osteoporosis consequently leading to more hospital admissions. Another study done in Sri Lanka shows an incidence rate of fall in females is around 515 per 1000 person years compared to 462 per 1000 person years for males [8].

Most falls (40%) were within the 70 – 79 years age group, followed by the 80-89 years age group, which had 28% of the falls. Our age group stratification is slightly different, however 74% of falls in our study had occurred in those above 70 years. A study by Ranaweera AD et al [8] states that those above 75 were twice as likely to have a fall.

Most (79%) of the patients were living with their families with 14% living alone and 7% in elders' homes. A study done in Colombo showed that 7.3% lived alone compared to 92.7% who lived with someone [8]. The fact that 21% of the patients were living alone or in elders home shows the possibility of a transition from the traditional extended families to a nuclear unit. This could be a post war effect with most of the children leaving the district or perishing in the war. This is of concern as with the aging population more falls and consequent comorbidities could be expected. Larger population studies would be needed to confirm this. However from the above pattern one should consider educating the elders of prevention of falls.

More than 50% of the subjects recalled a fall within 1 year of the index fall. Chronic illness and use of regular medication were seen in more than half of the study subjects. 54% of subjects reported fainting attacks dizziness or vertigo. One fifth of the patients were on two or more drugs and one fourth of the patients had 2 or more co- morbidities.

The study in Colombo showed that participants who had a fall in the previous year had more than fourfold risk of having another fall. The same study also disclosed the fact that the presence of more than two chronic ailments, dizziness, history of falls within the previous year and poor mobility had statistically significant relationship with falls [8]. A systematic review showed that the strongest association for falls was a previous history of falls [9].This further emphasizes the fact that attention should be paid to primary and secondary prevention of falls. Counselling on prevention of falls when elderly patients with multiple co-morbidities and on poly-pharmacy should be considered a priority in order to reduce falls. Further antihypertensive, antiarrhythmic, diuretics, sedatives and antidiabetic drugs can precipitate falls due to their mechanism of action. Counselling on side effects of these drugs while prescribing and reinforcing them during clinic visits, assessing the risk of falls every year and monitoring side effects should be considered.

Disability and poor mobility are well known risk factors for falls. In our study 26% had some degree of difficulty in walking, however 92% scored 6 on the Katz Index of Independence in Activities of Daily Living indicating complete independence with only 8 having some degree of difficulty in performing their activities of daily living. A systematic review on the characteristics of the elderly patients admitted with falls to the casualty showed that difficulties in the activities of daily living doubled the risk of falling [10]. Twenty two percent of our study population had some degree of memory impairment. In a study conducted in Colombo amongst residents of an elderly home 66% of elders demonstrating mild to severe cognitive deficits based on MMSE and MoCA [11]. The WHO Global report on falls prevention also reports similar figures [2]. In our study we used a 4 question screen considering the fact that extensive assessment using MoCA or MMSE could not be carried out in a busy casualty setting. This could account for the fact that only 22% showed memory impairment in our study.

Environmental factors play a major role in falls. About 85% of the falls were at home with 64% inside the house and 21% in the garden with slippery surface (in 40%) being reported as the major environmental contributor. Simple measures including keeping the floor dry could be easily practiced and this would significantly reduce the number of falls. Other studies have shown similar results and several studies have reported home safety assessment and modification interventions as effective in reducing the risk of falling [12].

In conclusion, most of characteristics reported in this study are preventable. Improving the awareness of the characteristics associated with falls amongst the elderly population and care givers will help decrease the incidence of falls. Further our cultural values and habits should be considered when advising on prevention of falls. A community based study with a larger population is recommended to further assess the characteristics associated with falls in the Jaffna district.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

References

1. Siddhisena KAP. Demography of aging in Sri Lanka. In: Aging populationin Sri Lanka. United Nations Population Fund 2004; 8 – 43.
2. World Health Organization. Ageing, Life Course Unit. WHO global report on falls prevention in older age. World Health Organization; 2008.
3. Tinetti ME, Speechley M, Ginter SF. Risk factors for falls among elderly persons living in the community. *N Engl J Med* 1988; 319: 1701 – 7. https://doi.org/10.1056/NEJM198812293192604
4. Nevitt MC, Cummings SR, Kidd S, Black D. Risk factors for recurrent non-syncopal falls. a prospective study. *JAMA* 1989; 261: 2663-8. https://doi.org/10.1001/jama.1989.03420180087036
5. Weerasuriya N, Jayasinghe S. A preliminary study of the hospital –admitted older patients in a Sri Lankan tertiary care hospital. Ceylon Medical Journal 2005; 50:18 – 9. http://doi.org/10.4038/cmj.v50i1.1584
6. Chu LW, Chi I, Chiu AY. Incidence and predictors of falls in

Chinese elderly. Annals Academy of Medicine Singapore 2005; 34: 60 – 72.
7. Malek-Ahmadi M, Davis K, Belden CM, Jacobson S, Sabbagh SN. Informant-reported cognitive symptoms that predict amnestic mild cognitive impairment.*BMC Geriatrics* 2012, 12:3 https://doi.org/10.1186/1471-2318-12-3
8. Ranaweera AD, Fonseka P, PattiyaArachchi A, Siribaddana S H. Incidence and risk factors of falls among the elderly in the district of Colombo. *Ceylon Medical Journal* 2013; 58: 100-106. https://doi.org/10.4038/cmj.v58i3.5080
9. Hennekens CH, Buring JE. *Epidemiology in Medicine*, 2ed. Boston/Toronto: Little Brown and company, 1987.
10. Silviaa D, Ersiliaa L, Francescaa L, et al. Risk factors for falls in community dwelling older people. A systematic review and meta-analysis. *Epidemiology* 2010: 21: 658-68. https://doi.org/10.1097/EDE.0b013e3181e89905
11. Thanthrige RS, Dassanayake S, Dissanayake D. relationship between increased risk of falling and cognitive impairment in residents of an elderly home in the Colombo district. *Ceylon medical Jopurnal* 2014; 59: 21-23. https://doi.org/10.4038/cmj.v59i1.6735
12. Gillespie LD, Robertson MC, Gillespie WJ et al. Interventions for preventing falls in older people living in the community. The Cochrane database of Systematic Reviews Library 2012;9: CD

REVIEW ARTICLE

Acute lower limb ischaemia

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Key words: Acute; limb; ischaemia; revascularisation

Introduction

Acute limb ischaemia (ALI) is defined as a sudden reduction in limb perfusion that results in a potential threat to limb viability. Symptoms must be present for less than 2 weeks although within this timeframe a range of presentations will be encountered [1]. Broadly, this will include those with a few hours of symptoms and a classically ischaemic limb with motor and sensory neurological signs, patients with short distance claudication and others with a marked deterioration in previously stable chronic limb ischaemia. The proportion in the final category will continue to increase both as populations age, with a higher population prevalence of peripheral arterial disease, and as cardiogenic sources of emboli responsible for classical ALI become increasingly rare [2].

Materials and methods

The classical "6 Ps" of ALI remain important but may be less pronounced if patients background chronic arterial disease. Nevertheless, the fundamental importance of prompt recognition of these classical features cannot be underestimated: pain, pallor, pulselessness, paraesthesia, perishingly cold and paralysis.

Full cardiovascular examination and assessment to exclude important differential diagnoses must be undertaken, Box 1.

Box 1 Differential diagnoses

- Compartment syndrome
- DVT
- Cerebrovascular accident (CVA/Stroke)
- Neuropathy
- Musculoskeletal (gout)
- Shock
- Vasoactive drugs

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Doppler assessment of pulses and calculation of the ankle brachial pressure index (ABPI) is essential to help categorise the severity of ischaemia.

Once the assessment is complete and the diagnosis of ALI is established classification of the insult according to the Rutherford criteria is essential, Table 1 [3].

Investigation

Standard investigations should include an ECG to identify atrial fibrillation, standard blood panels and imaging. Once the need for and urgency of imaging has been established the modality is determined by local expertise. The aim is to define the nature and extent of the problem and plan intervention in a timely manner. Options include duplex USS (non-invasive, usually quickly available but operator dependent), CT or MR angiogram (non-invasive and provide anatomical road map but require nephrotoxic contrast) or conventional digital subtraction angiography (advantage of the ability to intervene).

Management

Treatment objectives differ between revascularisation, amputation and palliation dependent on timing of presentation, severity of ALI and performance status. Initial management includes analgesia, oxygen, intra venous fluids and anticoagulation. Further management is determined according to the Rutherford classification, Figure 1.

Anticoagulation

To prevent further thrombus propagation anticoagulation should be instigated whilst awaiting further investigations. However, if immediate revascularisation is a possibility under spinal/regional anaesthesia in high risk patients, this may be deferred until after neuraxial block [4].

Standard therapy involves the use of intravenous unfractionated heparin (UFH). The use of UFH allows relatively quick reversal of clotting function should intervention become indicated.

The main disadvantage of its use involves the frequency of

Grade	Sensory Loss	Muscle Weakness	Arterial Doppler	Venous Doppler	Investigations
1. Viable	-	-	Audible	Audible	Diagnostic imaging
2. a. Threatened Salvageable prompt intervention	None/ minimal (toes)	-	Often absent	Audible	Diagnostic imaging urgently (< 24hrs)
b. Threatened Salvageable immediate intervention	More than toes with rest pain	Mild/ Moderate	Usually absent	Audible	Diagnostic imaging immediately or Hybrid Theatre
3. Irreversible Major tissue loss or nerve damage inevitable	Insensate	Profound/ paralysed	Absent	Absent	Not required

Table 1. Rutherford classification of acute limb ischaemia

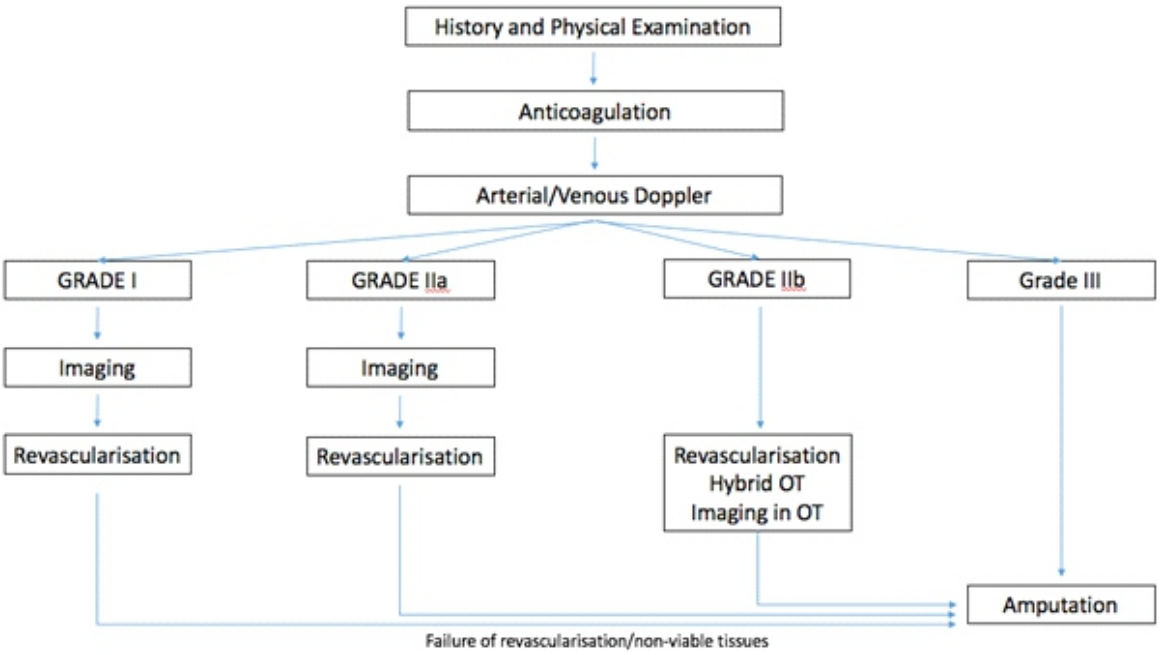

Figure 1 . Algorithm for the investigation and treatment of ALI. Adapted from Norgren et al 2007 (TASC II). OT, operating theatre.

Although subcutaneous low molecular weight heparin (LMWH) offers practical advantages and is widely used, there is currently no high level evidence supporting its use.

Thrombolysis

Berridge et al reviewed five randomized controlled trails comparing systemic thrombolysis and surgery in acute ischaemic limb [5-7]. The review concluded that there was no clear superiority of either treatment over another with limb salvage or mortality but major complications were more common with thrombolysis. There has been a decrease in the use of systemic thrombolysis due to concerns about efficacy and serious complications, Box 2 [8].

Box 2 Contraindications to thrombolysis

- Stoke within 2 months
- Acute haemorrhage
- Recent gastrointestinal bleed within 10 days
- Recent neurosurgery
- Intracranial trauma/lesion / aneurysm
- Recent surgery
- Uncontrolled hypertension
- Pregnancy

Grade I Viable & Grade IIa Threatened Salvageable with prompt intervention

Other than established surgical techniques (Box 3) emerging percutaneous endovascular interventions warrant consideration this group of patients although high level evidence to support their use remains sparse.

Catheter Directed Thrombolysis (CDT)

Regional thrombolytic therapy is delivered through an intra-arterial catheter within the thrombus. This reduces systemic distribution of thrombolytic agents. Compared to balloon catheter embolectomy there is a reduced risk of endothelial trauma and thrombolysis occurs in smaller branch vessels otherwise inaccessible to the balloon.

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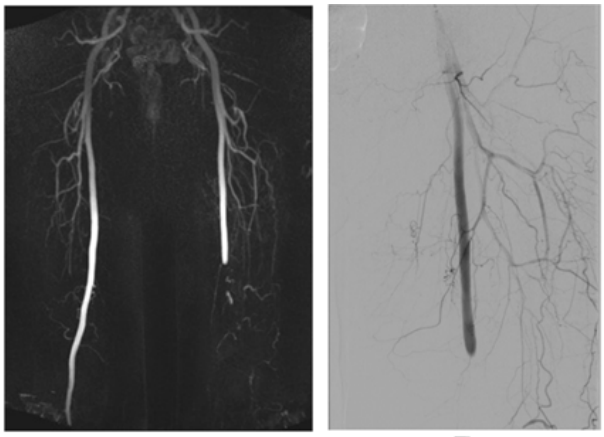

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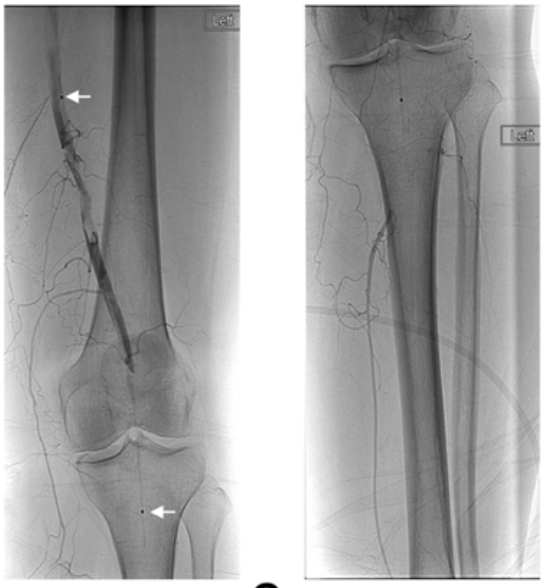

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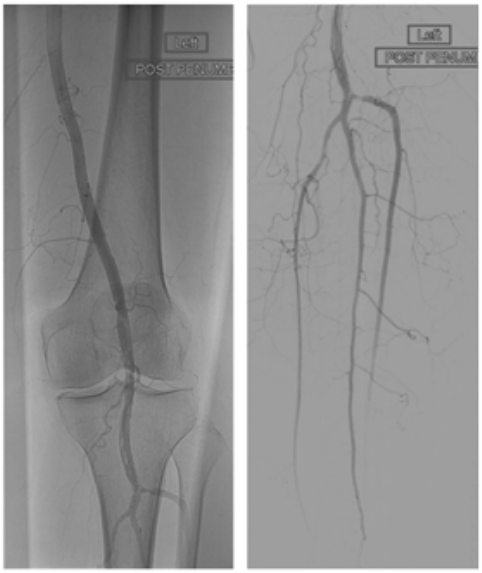

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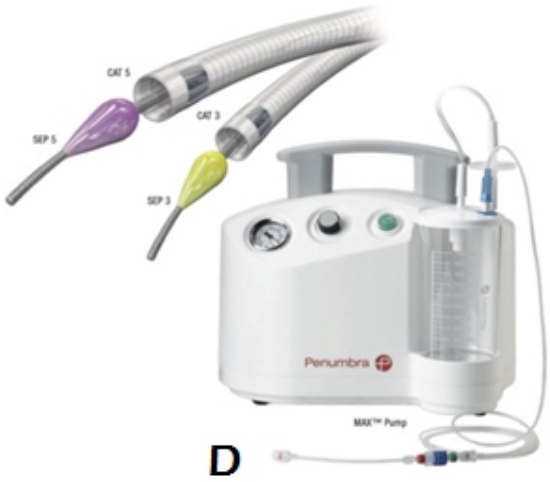

D

However, its use is limited by the availability of endovascular facilities, need for critical care, high costs, long duration required for the resolution of the thrombus and risks of bleeding and distal embolism [9].

Percutaneous Aspiration Thrombectomy (PAT)

This technique involves using large lumen aspiration catheters attached to suction with a syringe to remove

thrombo-embolic material (Pronto extraction catheter [Vascular Solutions, Inc., Minneapolis, MN], Export catheter [Medtronic, Inc., Minneapolis, MN]. This can be used in combination with thrombolytics to reduce required dose and increase speed of therapy [10]. The Penumbra System (PS; Penumbra, Alameda, California) offers the ability to both aspirate and extract material, Figure 2.

Percutaneous Mechanical Thrombectomy (PMT)

PMT utilises hydrodynamic or rotational systems to mechanically disrupt and aspirate thromboembolic material. This is useful for patients with high perioperative risks who are unsuitable for CDT. PMT is most effective for fresh thromboembolic material although some rotational devices are suitable for organised clots < 6 months old. Complications include distal embolization, fluid overload and the systemic effects of haemolysis. Some of these limitations are addressed by isolated pharmacomechanical thrombolysis-thrombectomy (IPMT) systems although they are not in widespread use [11].

Box 3 Surgical Techniques

- Balloon catheter embolectomy
- Transluminal thrombectomy
- Vascular bypass
- Endarterectomy
- Intraoperative thrombolysis
- Hybrid endovascular procedures

Figure 2 Endovascular treatment of acute limb ischaemia (ALI). Diagnostic images of a 71 year old female with breast cancer and left leg ALI. A, Magnetic resonance angiography (MRA) and B conventional digital subtraction angiography were performed and revealed superficial femoral artery (SFA) occlusion. Catheter directed thrombolysis (CDT) was performed using a fountain catheter for 24 hours with some improvement on check angiography, C (arrow heads proximal and distal limits of the infusion catheter). An underlying lesion was stented in the SFA and the Penumbra TM aspiration and extraction system (Alameda, California) D was used to remove thromboembolic material and provided excellent three vessel distal run-off, E.

Grade IIb Salvageable with immediate intervention

Surgery

Rutherford IIb patients generally require surgery although selected high risk patients may be managed with endovascular treatment. Factors to consider are anatomical location (open approach for supra inguinal and femoral bifurcation vs. endovascular techniques for popliteal trifurcation or distal lesions), nature of occlusion, duration of symptoms and the availability of endovascular resources. Access for surgical revascularisation should be planned in accordance with the location of the lesion. Femoral or popliteal approaches may be used to deploy a range of surgical techniques, Box 3.

Surgical result for infrainguinal balloon thrombectomy is generally poor, and bypass grafting may be more suitable. Endovascular therapy allows for imaging of underlying disease once the acute thrombosis is treated. This would facilitate assessment for further management. Similarly, completion angiography is performed in surgical revascularisation after clot retrieval to assess for underlying disease as well as residual occlusions.

In cases of late presentation diagnostic fasciotomies to assess tissue viability prior to attempted revascularisation is a useful approach. If deemed non-viable then amputation can be performed directly. Otherwise, prophylactic fasciotomies should be considered for those with prolonged periods of ischaemia, following complex procedures or after measurement of compartment pressures.

Grade III Irreversible major tissue loss or nerve damage inevitable

Amputation

Dehydration	Sepsis, gastroenteritis, diabetes
Hypotension	Cardiogenic – infarction, arrhythmia Haemorrhage
Malignancy	Increasingly common
Hyperviscosity	Haematological – thrombocytosis, polycythaemia
Thrombophilia	Protein C/S & Anthithrombin III deficiency, Activated Protein C resistance, Factor V Leiden, Anti-phospholipid

Table 2. Predisposing factors for acute thrombotic acute limb ischaemia. Adapted from Callum et al 2000.

Amputation is generally performed in the first instance if the patient has grade III ALI or following failure of revascularisation. Guillotine amputation may be performed if sepsis is present to minimise procedural time. Imaging is generally not required as the level of amputation is determined by clinical and intraoperative findings. Although promising in laboratory research no adjuncts are routinely available to determine the level of amputation (transcutaneous blood flow or oxygen pressures, thermometry, doppler or contrast enhanced imaging / angiography). Amputations should be performed within 48 hours from decision to operate, unless new medical contraindications arise [12].

Palliative

It is important to recognise ALI may be a pre-terminal event where aforementioned interventions are futile. Decisions to palliate should be made through a multidisciplinary approach with involvement of the patient, family, carers and with consideration to interventional risk and its effect on the patient's quality of life [13].

Source identification

If thrombosis has occurred at a site of pre-existing stenosis precipitating causes should be excluded, Table 2. Around 80% of embolic ALI will be from atrial thrombus associated with AF but other sources include the left ventricle, coronary valves, proximal aneurysmal disease (popliteal, abdominal/thoracic aorta), prosthetic grafts, paradoxical embolus and atrial myxoma. Echocardiography ± bubble studies, 24 hour ECG recording and cross sectional imaging will detect most underlying pathologies. 15% will remain idiopathic [14].

Secondary Prevention

Those with thrombotic ALI should continue on best medical therapy, receive advice on smoking cessation and supervised exercise programmes for the underlying PAD [15]. All patients should receive anticoagulation post operatively to prevent recurrent thromboembolism. The duration of treatment vary according to the underlying cause. Those with an underlying thrombophilia or embolic ALI should be anti-coagulated long term if appropriate [1, 11, 16].

Future Directions

Hybrid endovascular theatres hold promise for facilitating timely combined open and endovascular approaches as will dual trained vascular practitioners. The use of novel oral anti-platelets and anti-coagulants (NOAC) for PAD are currently being explored in randomised controlled clinical trials.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

References

1. Norgren L, Hiatt WR, Dormandy JA, Nehler MR, Harris KA, Fowkes FG. Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II). *J Vasc Surg*. 2007;45 Suppl S:S5-67. https://doi.org/10.1016/j.jvs.2006.12.037
2. Hirsch AT, Criqui MH, Treat-Jacobson D, Regensteiner JG, Creager MA, Olin JW, et al. Peripheral arterial disease detection, awareness, and treatment in primary care. *Jama.* 2001;286(11):1317-24. https://doi.org/10.1001/jama.286.11.1317
3. Rutherford RB, Baker JD, Ernst C, Johnston KW, Porter JM, Ahn S, et al. Recommended standards for reports dealing with lower extremity ischemia: revised version. *J Vasc Surg*. 1997;26(3):517-38. https://doi.org/10.1016/S0741-5214(97)70045-4
4. Horlocker TT. Regional anaesthesia in the patient receiving antithrombotic and antiplatelet therapy. *Br J Anaesth*. 2011;107 Suppl 1:i96-106. https://doi.org/10.1093/bja/aer381
5. Berridge DC, Kessel D, Robertson I. Surgery versus thrombolysis for acute limb ischaemia: initial management. *Cochrane Database Syst Rev*. 2000(4):Cd002784. https://doi.org/10.1002/14651858.CD002784
6. Ouriel K, Veith FJ, Sasahara AA. A comparison of recombinant urokinase with vascular surgery as initial treatment for acute arterial occlusion of the legs. Thrombolysis or Peripheral Arterial Surgery (TOPAS) Investigators. *N Engl J Med*. 1998;338(16):1105-11. https://doi.org/10.1056/NEJM199804163381603
7. Results of a prospective randomized trial evaluating surgery versus thrombolysis for ischemia of the lower extremity. The STILE trial. *Ann Surg*. 1994;220(3):251-66; discussion 66-8. https://doi.org/10.1097/00000658-199409000-00003
8. Richards T, Pittathankal AA, Magee TR, Galland RB. The current role of intra-arterial thrombolysis. *Eur J Vasc Endovasc Surg*. 2003;26(2):166-9. https://doi.org/10.1053/ejvs.2002.1915
9. Nachbur B, Baumgartner I, Do D, Mahler F, Ris H-B. Acute Limb Ischaemia: Endovascular Options. In: Barros D'Sa A, Chant A, editors. Emergency Vascular and Endovascular Practice. Second ed. London: *Hodder Arnold*; 2005. p. 181-95. https://doi.org/10.1201/b13193-24
10. Zafar N, Prasad A, Mahmud E. Utilization of an aspiration thrombectomy catheter (Pronto) to treat acute atherothrombotic embolization during percutaneous revascularization of the lower extremity. *Catheter Cardiovasc Interv*. 2008;71(7):972-5. https://doi.org/10.1002/ccd.21561
11. Creager MA, Kaufman JA, Conte MS. Clinical practice. Acute limb ischemia. *N Engl J Med*. 2012;366(23):2198-206. https://doi.org/10.1056/NEJMcp1006054
12. The Vascular Society of Great Britain and Ireland Quality Improvement Framework for Major Amputation Surgery. Vascular Society of Great Britain and Ireland. 2010. Available from: https://www.vascularsociety.org.uk
13. Campbell WB, Verfaillie P, Ridler BM, Thompson JF. Non-operative treatment of advanced limb ischaemia: the decision for palliative care. *Eur J Vasc Endovasc Surg*. 2000;19(3):246-9. https://doi.org/10.1053/ejvs.1999.1052
14. Callum K, Bradbury A. ABC of arterial and venous disease: Acute limb ischaemia. *Bmj*. 2000;320(7237):764-7. https://doi.org/10.1136/bmj.320.7237.764
15. National Institute for Health and Care Excellence. NICE Guidelines CG147: Lower limb peripheral arterial Available from: https://www.nice.org.uk/guidance/CG147
16. Alonso-Coello P, Bellmunt S, McGorrian C, Anand SS, Guzman R, Criqui MH, et al. Antithrombotic therapy in peripheral artery disease: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest.* 2012;141(2 Suppl):e669S-90S. https://doi.org/10.1378/chest.11-2307

Acute kidney injury in sepsis

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Abstract

Sepsis is life-threatening organ dysfunction resulting from a dysregulated host response to infection. It is one of the commonest causes of acute kidney injury (AKI) and is associated with an increase in both morbidity and mortality. Both haemodynamic and non-haemodynamic factors are involved in the pathogenesis of AKI in sepsis. Newer tests are available for the early diagnosis of AKI in septic patients and may provide an opportunity for prevention. The current mainstay of prevention is adequate fluid resuscitation and maintenance of systemic blood pressure, noradrenaline being the vasopressor of choice. Renal replacement therapy may improve outcomes. Continuous renal replacement modalities are preferred in those who are haemodynamically unstable. There is no consensus on the optimal timing or dose of renal replacement therapy.

Introduction

Sepsis has recently been redefined as life-threatening organ dysfunction resulting from a dysregulated host response to infection [1]. Renal dysfunction may be seen in up to 16-67% of patients with sepsis [2]. This manifests as acute kidney injury (AKI), and is diagnosed based on a rise in serum creatinine and/or a reduction in urine output within a short period of time [3]. Sepsis is one of the commonest causes of AKI, and accounts for 26-60% of AKI seen in developed nations [2].

The occurrence of AKI in a patient with sepsis is a bad prognostic factor and is associated with increases in patient morbidity and mortality, as well as in health care costs [4].

Pathophysiology of AKI in sepsis

The pathogenesis of AKI in sepsis is poorly understood. This may be one of the reasons why the outcomes of sepsis-induced AKI remain unsatisfactory, even in the face of medical advancement.

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The classical models of pathophysiology have concentrated on sepsis induced haemodynamic changes as being the main mechanism of kidney injury in sepsis. However, more recent understanding is that both haemodynamic and non-haemodynamic mechanisms contribute to the development of AKI in septic patients. [5, 6] Difficulties in performing invasive experimental tests on critically ill patients and the lack of comparable animal models have hindered attempts to gain information about human sepsis-induced AKI. Much of our current understanding is based on limited human studies or indirect evidence from conflicting animal studies [5].

a) Haemodynamic changes in sepsis and AKI

The haemodynamic effects of sepsis on the kidney are variable. On one hand some studies have shown that endotoxaemia results in a reduction in renal blood flow and, hence, glomerular filtration rate. This hypoperfusion, if prolonged, can lead to tubular ischemia and acute tubular necrosis [7]. However, other studies have shown that the renal circulation participates in the systemic vasodilatation that is seen in sepsis, thereby leading to increased renal blood flow and the occurrence of AKI in a setting of normal or increased renal perfusion [5, 8].

This underscores the importance of glomerular filtration pressure, rather than renal blood flow, as a major determinant of glomerular filtration rate and kidney function. Glomerular filtration pressure is determined by the balance between the vascular tone of the afferent and efferent arterioles of the glomerulus. In the presence of both afferent and efferent arteriolar dilatation, with the efferent affected more than the afferent the glomerular filtration pressure will fall, despite an increase in renal blood flow. This may set the stage for hyperdynamic AKI, a unique form of AKI that is seen in sepsis [5].

How far these models, which are mainly based on animal studies, truly reflect the pathogenesis of human AKI is still open for debate. Further studies on humans will be needed to test their validity.

b) Non- haemodynamic injury leading to AKI in sepsis

Neither global nor intra-renal haemodynamic changes have

been consistently shown to be the sole contributor to the development of AKI in sepsis. The non-haemodynamic factors contributing to sepsis induced AKI may be immunological or toxic. A multitude of inflammatory mediators and neuroendocrine mechanisms play a role in the response to infection [9].

The reaction to severe infection comprises a pro-inflammatory and an anti-inflammatory response, which are activated in sequence and may sometimes overlap. [10] The recognition of pathogen associated molecular patterns (PAMPs) by Toll like receptors (TLR) on innate immune cells leads to activation of the humoral and cellular arms of the innate immune response. This results in the activation of complement and procoagulatory pathways, recruitment of inflammatory cells, release of pro-inflammatory cytokines, and formation of free radicals. These humoral and cellular changes result in widespread endothelial dysfunction, capillary leakage, microvascular thrombosis and impaired vascular tone. At the level of the kidney this manifests as infiltration of the renal parenchyma with inflammatory cells, intra-glomerular thrombus formation, and obstruction of the renal tubules with necrotic cells and debris [6]. Apoptosis of renal tubular cells and tubular dysfunction in the face of sepsis may contribute to kidney injury and the development of acute renal failure [5].

Detection of AKI in sepsis

Early detection of AKI in sepsis may allow for therapeutic measures that will improve outcomes. The detection of AKI by current diagnostic criteria based on serum creatinine and reduction in urine output may be delayed, and may therefore reduce the effectiveness of therapeutic interventions.

In fact, due to a variety of reasons, serum creatinine is an unreliable marker in diagnosing AKI in patients with ongoing sepsis [11,12]. Certain novel biomarkers may be better predictors of AKI. These include urinary interleukin-18 (IL-18)[13], neutrophil gelatinase associated lipocalin (NGAL) [14] and kidney injury molecule-1 (KIM-1)[15]. Interestingly, some of these biomarkers are noted to be higher in sepsis associated AKI compared to non-septic AKI.[6] However the exact role of these biomarkers in the diagnosis of AKI in the setting of sepsis is not yet clearly defined and therefore they are not yet recommended for routine use in the ICU.

Prevention and management of sepsis induced AKI

a) Fluid resuscitation and vasopressors

Controversy remains regarding the effectiveness, type, volume and duration of fluid resuscitation in septic shock [16]. Contrary to traditional teaching, the principle that more is better is no longer true, even with regard to the kidney. Though volume resuscitation is vital to maintain cardiac output, over-hydration results in tissue oedema and a reduction in oxygen delivery to target tissue. Low plasma oncotic pressure seen as part of the systemic response to inflammation, exacerbates tissue oedema in fluid overloaded patients [17]. While early aggressive fluid resuscitation may be life- saving, it may be necessary to combine this with early initiation of renal replacement therapy to in order to avoid fluid overload [16].

Crystalloids are preferred over colloids in fluid replacement. In particular hydroxyl ethyl starch (HES) has been associated with osmotic nephrosis and is best avoided [18]. Among the crystalloids buffered solutions such as Ringer's lactate may have benefits over isotonic saline [19]. Sepsis guidelines advocate a central venous pressure of 8-12 cmH_20 to be maintained in septic patients[20]. High central venous pressure may be detrimental to renal function as tissue oedema within the renal capsule may result in a "renal compartment syndrome" leading to a reduction in effective renal perfusion and, therefore, function [16]. The target mean arterial pressure in sepsis as recommended by guidelines is 65 mmHg [20].

The vasopressor of choice is noradrenaline, as kidney performance in sepsis is dependent on renal perfusion pressure rather than renal oxygen delivery [21]. This is despite previous concerns that vasoconstriction may aggravate renal hypoperfusion, a theory that has since been proven false. In fact renal perfusion has been shown to increase with norepinephrine, perhaps due to an increase in the mean arterial pressure as well as reflex renal vasodilatation following the increase in systemic blood pressure [22]. Concerns regarding the use of adrenaline include the risk of tachycardia, hyperglycaemia, hyperlactataemia and acidosis. There is no place for "low dose" dopamine as a reno-protective inotrope [23].

b) Supportive management

Diuretics

Diuretics may be beneficial in patients with evidence of fluid overload. They should not be used for the sole purpose of improving urine output, particularly in hypovolemic patients [16].

Avoid nephrotoxins

Drugs to avoid in AKI include angiotensin converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), non-steroidal anti-inflammatory drugs (NSAIDs), and radiocontrast. All drug doses and dosing regimes, including those of antibiotics, must be adjusted according to the estimated glomerular filtration rate and the Renal Replacement Therapy (RRT) modality and time schedule.

c) Renal replacement therapy

The goals of renal replacement therapy (RRT) in AKI are to optimize fluid and electrolyte, acid-base, and solute balance, prevent further renal injury while promoting renal recovery, and to allow other supportive measures, such as drug therapy and nutrition, to proceed with minimal limitation [3].

Modalities of RRT

The main modes of RRT in acute kidney injury can be broadly categorized as intermittent and continuous. Intermittent RRT includes intermittent haemodialysis and isolated ultrafiltration delivered in short intermittent courses separated by several hours or days. This contrasts with continuous therapies which are, by their very definition, uninterrupted. The continuous therapies include continuous venovenous haemodialysis (CVVHD), continuous venovenous haemodiafiltration (CVVHDF) and continuous venovenous haemofiltration (CVVHF) which are based on varying combinations of the principles of diffusion, ultrafiltration and convection. Intermittent RRT is often more readily available, less expensive, allows for more rapid correction of fluid and electrolyte imbalances and maintains the mobility of the patient while off treatment. However, CRRT has the advantage of causing less haemodynamic disturbance and allowing for smoother fluid management, at the cost of risks such as prolonged anticoagulation.

Guidelines recommend that haemodynamically unstable patients are best managed with continuous renal replacement therapies (CRRT). There is, as yet, no evidence to recommend either CRRT or intermittent renal replacement therapies (IRRT), such as haemodialysis, over the other in haemodynamically stable patients [3]. Hybrid methods such as slow low efficiency daily dialysis (SLEDD) attempt to combine the best of both intermittent and continuous therapies while minimizing their disadvantages.

Timing of RRT

Absolute indications to initiate RRT are severe hyperkalaemia, severe acidosis, pulmonary oedema, and uraemic complications [3, 24]. There may be benefit in initiating CRRT at the onset of kidney injury before frank conventional clinical and biochemical criteria are met [25]. However, the evidence for this approach is conflicting and studies have not consistently shown any advantage in early initiation of RRT [3]. Clinicians often observe clinical and biochemical trends in making decisions on RRT.

Dose of RRT

Uncertainties remain regarding the optimal dosing of RRT in AKI. The Acute Renal Failure Trial Network (ARFTN) study demonstrated that there is no benefit of intermittent haemodialysis six times a week vs three times a week or CVVHDF at a dose of 35 ml/kg/h vs 20 ml/kg/h [26]. Similarly The Randomized Evaluation of Normal versus Augmented Level (RENAL) replacement therapy study failed to show any advantage of 40 ml/kg/h CVVHDF vs 20 ml/kg/h [27].

Potential therapies

Potential therapies for sepsis induced AKI may focus on targeting the inter-connected pathogenetic mechanisms of inflammation, microvascular dysfunction and tubular cell adaptation. Studies based on the importance of cytokines in this process have offered haemadsorption as a potential strategy to prevent the onset of AKI in sepsis[28]. Extracorporeal therapy with Polymixin B has been shown in some clinical studies to reduce pro-apoptotic factors leading to kidney injury and to reduce organ dysfunction in sepsis [29,30]. Adjunctive treatment with exogenous alkaline phosphatase is currently under investigation for its detoxifying potential [16].

Conclusion

The development of AKI in sepsis is a consequence of systemic and local haemodynamic changes that result in reduced glomerular filtration and non – haemodynamic toxic and immunological processes. Present tactics in treatment and prevention focus largely on correcting the haemodynamic changes of sepsis. These include fluid resuscitation and vasopressors.

The initiation of renal replacement therapy is known to improve outcome, though the timing, intensity and mode are still under debate. CRRT is preferred in haemodynamically unstable patients. Treatment varies according to the individual patient. The future may lead to therapies that directly target the inflammatory pathways that lead to sepsis offering an opportunity for further prevention of AKI in sepsis.

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References

1. Singer, M., et al., THe third international consensus definitions for sepsis and septic shock (sepsis-3). *JAMA,* 2016. 315(8): p. 801-810. https://doi.org/10.1001/jama.2016.0287
2. Alobaidi, R., et al., Sepsis-Associated Acute Kidney Injury. *Semin Nephrol*, 2015. 35(1): p. 2-11. https://doi.org/10.1016/j.semnephrol.2015.01.002
3. Kidney Disease: Improving Global Outcomes (KDIGO) Acute Kidney Injury Work Group. *KDIGO* Clinical Practice Guideline for Acute Kidney Injury. Kidney inter., Suppl. 2012; 2: 1–138.

4. Bagshaw, S.M., et al., Septic Acute Kidney Injury in Critically Ill Patients: Clinical Characteristics and Outcomes. *Clinical Journal of the American Society of Nephrology*, 2007. 2(3): p. 431-439.
https://doi.org/10.2215/CJN.03681106
5. Wan L, B.S., Langenberg C, Saotome T, May C, Bellomo R Pathophysiology of septic acute kidney injury: What do we really know? *Crit Care Med* 2008. 36: p. S198 –S203,
https://doi.org/10.1097/CCM.0b013e318168ccd5
6. Zarjou, A. and A. Agarwal, Sepsis and Acute Kidney Injury. *Journal of the American Society of Nephrology*, 2011. 22(6): p. 999-1006.
https://doi.org/10.1681/ASN.2010050484
7. Kikkeri D, P.J., Hwang KH, Jacob AI, Richman AV, Bourgoignie JJ, Endotoxemic acute renal failure in awake rats. *Am J Physio*l 1986. 206: p. F 1098–106.
8. Langenberg C, W.L., Egi M, et al Renal blood flow in experimental septic acute renal failure. *Kidney Int* 2006. 69: p. 1996 –2002.
https://doi.org/10.1038/sj.ki.5000440
9. Marshall JC, V.J., Fink MP, et al, Measures, markers, and mediators: Toward astaging system for clinical sepsis. A report ofthe Fifth Toronto Sepsis Roundtable, Toronto, Ontario, Canada, October 25–26,2000. *Crit Care Med*, 2003. 31: p. 1560 –1567.
https://doi.org/10.1097/01.CCM.0000065186.67848.3A
10. Hotchkiss , R.S. and I.E. Karl The Pathophysiology and Treatment of Sepsis. *New England Journal of Medicine,* 2003. 348(2): p. 138-150.
https://doi.org/10.1056/NEJMra021333
11. Doi K, Y.P., Eisner C, Hu X, Leelahavanichkul A, Schnermann J, Star RA, Reduced production of creatinine limits its use as marker of kidney injury in sepsis. *J Am Soc Nephrol* 2009. 20: p. 1217–1221.
https://doi.org/10.1681/ASN.2008060617
12. Charlton, J.R., D. Portilla, and M.D. Okusa, A basic science view of acute kidney injury biomarkers. *Nephrol Dial Transplant,* 2014. 29(7): p. 1301-11.
https://doi.org/10.1093/ndt/gft510
13. Bagshaw SM, L.C., Haase M, Wan L, May CN, Bellomo R, Urinary biomarkers in septic acute kidney injury. *Intensive Care Med* 2007. 33: p. 1285–1296.
https://doi.org/10.1007/s00134-007-0656-5
14. Siew ED, W.L., Gebretsadik T, Shintani A, Moons KG, Wickersham N, Bossert F, Ikizler TA Urine neutrophil gelatinase-associated lipocalin moderately predicts acute kidney injury in critically ill adults. *J Am Soc Nephrol*, 2009. 20: p. 1823–1832.
https://doi.org/10.1681/ASN.2008070673
15. Zhang Z, H.B., Bonventre JV, Shedding of the urinary biomarker kidney injury molecule-1 (KIM-1) is regulated by MAP kinases and juxtamembrane region. *J Am Soc Nephrol* 2007. 18: p. 2704–2714.
https://doi.org/10.1681/ASN.2007030325
16. Honore, P.M., et al., Prevention and treatment of sepsis-induced acute kidney injury: an update. *Ann Intensive Care*, 2015. 5.
https://doi.org/10.1186/s13613-015-0095-3
17. Andreucci M, F.S., Andreucci VE, *Edema and acute renal failure. Semin Nephrol.*, 2001. 21: p. 251–256.
https://doi.org/10.1053/snep.2001.21652
18. Mutter TC, R.C., Dart AB, Hydroxyethyl starch (HES) versus other fluid therapies: effects on kidney function. *Cochrane Database Syst Rev*, 2013;. 23.
doi: 10.1002/14651858.CD007594.pub3.
19. Yunos, N., et al., Association between a chloride-liberal vs chloride-restrictive intravenous fluid administration strategy and kidney injury in critically ill adults. *JAMA*, 2012. 308(15): p. 1566-1572.
https://doi.org/10.1001/jama.2012.13356
20. Dellinger, R.P., et al., Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock, 2012. *Intensive Care Medicine*, 2013. 39(2): p. 165-228.
https://doi.org/10.1007/s00134-012-2769-8
21. Bellomo, R., L. Wan, and C. May, Vasoactive drugs and acute kidney injury. *Critical Care Medicine*, 2008. 36(4): p. S179-S186.
https://doi.org/10.1097/CCM.0b013e318169167f
22. Anderson, W.P., P.I. Korner, and S.E. Selig, Mechanisms involved in the renal responses to intravenous and renal artery infusions of noradrenaline in conscious dogs. *J Physiol*, 1981. 321: p. 21-30.
https://doi.org/10.1113/jphysiol.1981.sp013969
23. Friedrich, J.O., et al., Meta-Analysis: Low-Dose Dopamine Increases Urine Output but Does Not Prevent Renal Dysfunction or Death. *Annals of Internal Medicine,* 2005. 142(7): p. 510-524.
https://doi.org/10.7326/0003-4819-142-7-200504050-00010
24. Zhang, Z., Biomarkers, diagnosis and management of sepsis-induced acute kidney injury: a narrative review. *Heart Lung Vessel*, 2015. 7(1): p. 64-73.
25. Joannes-Boyau, O., et al., High-volume versus standard-volume haemofiltration for septic shock patients with acute kidney injury (IVOIRE study): a multicentre randomized controlled trial. *Intensive Care Medicine*, 2013. 39(9): p. 1535-1546.
https://doi.org/10.1007/s00134-013-2967-z
26. The VA/NIH Acute Renal Failure Trial Network. Intensity of Renal Support in Critically Ill Patients with Acute Kidney Injury. *The New England journal of medicine*. 2008;359(1):7-20.
https://doi.org/10.1056/NEJMoa0802639
27. The RENAL Replacement Therapy Study Investigators. Intensity of Continuous Renal-Replacement Therapy in Critically Ill Patients. *N Engl J Med* 2009; 361:1627-1638
https://doi.org/10.1056/NEJMoa0902413
28. Peng, Z.Y., et al., Acute removal of common sepsis mediators does not explain the effects of extracorporeal blood purification in experimental sepsis. *Kidney Int*, 2012. 81(4): p. 363-9.
https://doi.org/10.1038/ki.2011.320
29. Cantaluppi, V., et al., Polymyxin-B hemoperfusion inactivates circulating proapoptotic factors. *Intensive Care Me*d, 2008. 34(9): p. 1638-45.
https://doi.org/10.1007/s00134-008-1124-6
30. Cruz, D.N., et al., Early use of polymyxin b hemoperfusion in abdominal septic shock: The euphas randomized controlled trial. *JAMA,* 2009. 301(23): p. 2445-2452.
https://doi.org/10.1001/jama.2009.856

Defending medical negligence claims: a surgeon's guide (part II)

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Continued from Previous Issue....

Avenues to Defend

7) Disclosure and consent

The defence of disclosure and consent is particularly significant to surgical practice, because it is at the point of treatment by surgery that risk disclosure by the surgeon and consent by the patient becomes relevant. This is because, unlike previous stages of the doctor-patient relationship, such as the stage of consultation or diagnosis, bodily invasion of a serious nature occurs during surgery.

Invasion occurs to a much lesser extent during clinical examination or treatment by prescribing medication. For reasons of brevity, this part of the discussion will not include the historical or moral/ethical/fiduciary dimensions of disclosure and consent relating to medical treatment nor the issue of capacity to consent. It will be confined to the manner in which the law treats disclosure as a requirement and, consequently, consent as a defence in relation to medical negligence.

Although the famous Bolam case too concerned the doctor's failure to warn the patient of the risks of electroconvulsive therapy, it is in Sidaway v. Board of Governors of the Bethlem Royal Hospital and Maudsley Hospital [1], that a detailed judicial analysis of the duty of disclosure and patient consent is provided by a UK court. In this case, the claimant complained that the neurosurgeon had not warned her of a 1-2% risk of paraplegia which was associated with the surgical procedure of cervical cord decompression – which warning would have caused her to forego the surgery – and that the surgery had resulted in damage to the spinal cord, leaving her with a serious disability. While all of the judges were in agreement that doctors owe a duty of care to disclose information, no uniform approach as to the standard of this duty of care is found in the House of Lords judgment.

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Lord Diplock applied the Bolam standard, thus holding that the level of disclosure should be in conformity with responsible medical practice, Lord Scarman referred to cases from Canada and the USA on informed consent and a patient's basic human right to make his own medical decisions and Lords Bridge, Keith and Templeman attempted to strike a balance between the two positions. However, the unanimous decision was that there had not been any negligence by the defendant's failure to disclose the risk.

Yet, the current trend across jurisdictions seems to be veering towards the application of the prudent patient test (what a reasonable person in the patient's position would want to know) rather than the reasonable doctor test (what a doctor ought to disclose to a patient, according to accepted medical practice). For example, Lord Diplock's approach based on the latter test was not followed in subsequent decisions in UK courts and has been expressly rejected by courts in some Commonwealth jurisdictions, as well as South Africa.

In Pearce v. United Bristol Healthcare NHS Trust [2], the consultant had not warned a pregnant woman of the 0.1-0.2% risk of still-birth associated with natural birth, despite the fact that she was two weeks overdue and had begged for induced labour or a caesarean, and the baby died in utero a few days later. Lord Woolf came to a finding of negligence, on the basis that the risk disclosure would have affected the judgment of a reasonable patient. This decision was followed in the cases of Chester v. Afshar [3] and Birch v. UCL Hospital Foundation Trust [4]. In the Chester case, the patient having suffered a motor and sensory disturbance in her body, consequent to spinal surgery, the same surgeon decided that another operation was necessary. But he failed to disclose a small risk of cauda equana which results in severe disability and that risk unfortunately materialised after the second surgery. Lord Steyn held that there was negligence by the defendant surgeon:

> *A surgeon owes a legal duty to a patient to warn him or her in general terms of possible serious risks involved in the procedure. The only qualification is that there may be wholly exceptional cases where objectively in the best interest of the patient the surgeon may be excused from giving a warning. This is, however, irrelevant to the*

present case. In modern law medical paternalism no longer rules and a patient has a prima facie right to be informed by a surgeon of a small, but well established, risk of serious injury as a result of surgery.

In the Australian case of Rogers v. Whitaker [5], the Bolam test was discarded insofar as the field of non-disclosure of risk and the provision of advice and information are concerned and court held that "while evidence of acceptable medical practice is a useful guide for the courts, it is for the court to adjudicate on what is the appropriate standard of care after giving weight to 'the paramount consideration that a person is entitled to make his own decisions about his life [5]." Likewise, in the Canadian cases of Reibl v. Hughes [6] and Hopp v. Lepp [7], patient autonomy was central to the test applied. In the Reibl case, the claimant testified that, had he known about the risk involved, he would have postponed the surgery until his lifetime retirement pension started. In holding the surgeon liable for negligence, court also took into consideration the fact that surgeon should have taken special care to ensure that he was understood, considering that the patient's difficulty with the English language. In a later case, Haughian v. Paine [8], the neurosurgeon's failure to inform of the risk of paralysis associated with the recommended surgery and failure to inform of the alternatives of no treatment and conservative management were held to be negligent.

Furthermore, "in South Africa, informed consent is routinely endorsed in the health care field and confirms that it is a valid defence to medical malpractice [9]." The decision in Castell v De Greef [10] is particularly significant because court viewed informed consent upon a right-based approach, by accepting patients' autonomy as a fundamental right in South Africa against medical supremacy. Here, the specialist plastic surgeon had not warned the patient of the material risks and complications which were associated with the surgical operation known as a subcutaneous mastectomy. Because of necrosis of skin underlying tissues, it has a high risk of complications. Necrosis followed after the initial operation and the patient had to undergo several further surgical procedures, causing her to suffer physically, mentally and financially. The surgeon was found negligent for failure to disclose the risk.

It must also be stressed that the legal requirement of disclosure not only includes a surgeon's duty to inform the patient of potential risks of the proposed surgery, but also the duty to inform patients of errors caused during surgery and which now pose fresh risks. In such cases, the surgical error itself may not have been a negligent act, but the failure to inform the patient of that error can attract legal liability. This is because the injury caused by the non-negligent error will nonetheless present risks associated with the patient's future health and, without that knowledge, the patient would be exposed to danger. Since the failure to disclose surgical errors has generally been treated as a breach of fiduciary duty rather than a breach of the duty of (medical) care and it is the latter which is relevant to medical negligence litigation, this paper will not elaborate on the subject any further. However, it is important for surgeons to be mindful that they owe to their patient a duty of candour, as much as a duty of care [11].

One way to formulate a defence where medical negligence claims are based on lack of informed consent is to comply with and rely on available clinical guidelines on the subject. In the UK, the General Medical Council has stipulated guidelines on consent, based on a subjective patient-specific standard of information disclosure [12]. Another defence associated with the defence of obtaining informed consent is that of assumption of risk (volenti non fit injuria). In such cases, a patient elects/rejects treatment, assuming the risk which has been adequately disclosed to him, and the question is whether a doctor could still be liable if that risk materializes. Examples are found often where patients' religious beliefs influence their healthcare decisions. For instance, in the Nigerian case of Okonkwo v. Medical and Dental Practitioners' Disciplinary Tribunal [13], the anaemic patient was a Jehovah's Witness and refused a blood transfusion although no alternative treatment was available, a decision which eventually led to her untimely death. The mother of the patient complained to the Disciplinary Tribunal which found the defendant doctor negligent. However, in appeal, the court reversed that finding, on the basis that the doctor had adequately discharged his duty of disclosure and the patient had assumed the risk.

Before winding up the discussion on the defence of consent, it is also important to realize that if consent has not been obtained, informed or otherwise, surgeons would be causing trespass to the person and thus liable for battery under the law of tort or the offence of assault under criminal law. In Chatterton v. Gerson [14], the patient who was suffering from chronic and unendurable pain in a post-operative scar and sent to a pain clinic for treatment had consented to the surgical procedure of blocking a sensory nerve which ultimately led to her losing sensation in one leg. Therefore, although she claimed that the failure to inform her of the procedure's implications, such as temporary loss of muscle power, amounted to no consent at all, court was reluctant to come to a finding of battery on this basis: "…once the patient is informed in broad terms of the nature of the procedure which is intended, and gives her consent, that consent is real, and the cause of action on which to base a claim for failure to go into risks and implications is negligence, not trespass"[14]. However, the judgment cites an older decision where a charge of battery was successfully maintained in the case of a boy who was admitted to hospital for a tonsillectomy and, due to an administrative error, was circumcised instead. In Wells v. Surrey AHA [15], where a sterilization operation was first suggested to the patient during labour, at a stage when she

would not have been in a position to appreciate the implications of surgery, and sterilization was thereafter carried out at the same time as a caesarean section, court once again found that inadequate advice about the surgery amounted only to negligence and not battery. Similarly, in the South African case of Lowrense v Oldwage [16], the claim was that the defendant surgeon who performed vascular surgery on the patient had not warned of the risk of claudication and, as a result, there was inadequate consent to surgery, and the operation therefore constituted an assault. In rejecting liability for assault, the Supreme Court of Appeal appears to have accepted the evidence of the defendant's medical expert, that the likelihood of the risk of claudication occurring was 2% and concluded that the risk to the plaintiff was so negligible that it was not unreasonable for the defendant not to mention it [16].

To conclude the discussion on a defence based on disclosure and consent, it is appropriate to consider the practical problem of establishing before a court of law what information was, in fact, disclosed to the patient prior to a surgery:

> *Patients are unlikely to have made notes during their encounter with the doctor, and many years later, may not be able to accurately recall what they were told. Doctors' notes seldom record every detail of the conversations they have had with patients, and it is often difficult for doctors to remember exactly what passed between them and an individual patient, particularly if the consultation happened some years ago, the courts will therefore often be faced with two contradictory accounts of the discussions that took place prior to treatment. Evidence of a doctor's usual practice will sometimes be relevant, though in many cases, the judge will simply have to decide who the more credible witness is [17].*

Needless to say, a comprehensive consent form is the best evidence of disclosure and consent. However, problems posed by illiteracy, the paternalistic doctor-patient relationship and attitudes, especially, the blind faith that patients in Sri Lanka continue to repose in their doctors call into question whether a signature on a consent form is the "real consent" that would pass the legal test of disclosure and informed consent.

8) Lack of causation

Research in the USA has revealed that the prevalent types of injuries caused by surgical errors are operative injuries, visceral/nerve injuries, unexpected bleeding, a foreign body left in the patient, failure to relieve, musculoskeletal injuries, wrong site injuries and wrong patient injuries [18]. While most of these injuries demonstrate that the facts speak for themselves (res ipsa loquitur) that the injury could be directly attributed to a surgical error, it may not always be possible to trace the cause of an injury to an act of medical negligence by the surgeon. This is an important element in the construction of a defence on behalf of a surgeon, because it gives him a chance to fight liability in a medical negligence lawsuit, even though he may have been negligent. The Priyani Soyza case provides a classic example; for, although the Supreme Court found the doctor to have been remiss in not having properly maintained the BHT and not ordering a CT scan, it was also of the view that, because the patient was suffering from a terminal illness from which she would have died in any event, there was no causal link between the doctor's negligence and the patient's death [19].

The legal test used to determine causation is the 'but-for' test. In a medical negligence case, the question to be answered is, but for the defendant's negligence would the claimant have suffered the injury? If a patient is injured in the course of a medical event, a doctor would be found liable for medical negligence if there was an error and the injury complained of was caused by that error. Therefore, even if court comes to a finding that a surgical error has occurred, it would be part of the formulation of the surgeon's defence to say that the claimant had not been able to prove that it was that error which caused the injury and offer instead other explanations, i.e. that the injury is a pre-existing injury or that an intervening factor for which the doctor is not responsible broke the chain of causation.

Where there is no question that the injury can be solely attributed to the surgical error and that error alone, there is little or no defence. However, if there is uncertainty in the link between the error and the link, the defendant doctor is on a better wicket to avoid liability. In the Wilsher case, excess of oxygen on two occasions was only one of five possible causes of the patient's blindness and, so, without a definite causal nexus between the excess of oxygen and the injury, the claimant's case failed. In loss of chance cases, the claimant has to prove on a balance of probabilities that the negligence materially contributed to the injury.

Thus, the inability of the claimant to prove that the delayed diagnosis/treatment following a hip injury from a fall was more likely than not to have caused avascular necrosis resulted in his action being dismissed, in the case of Hotson v. East Berkshire AHA [20]. In Gregg v. Scott [21], where the GP had failed to diagnose a lymphoma and refer the patient to a specialist, the claimant could not prove, on a balance of probabilities that his chance of survival had reduced by the misdiagnosis because the prospect of recovery was less than 50%. On the other hand, in Gouldsmith v. Mid Staffordshire General Hospitals NHS Trust [22], the claimant was able to prove that, had she been referred to specialist hospital for the lesions which she was suffering from, it was more likely than not that a specialist would have operated and she could have avoided having her fingers amputated. Therefore, both cases

applied the 'but-for' test; but, while in the former case, a successful defence could be made out on lack of causation, it was not so in the latter.

It is pertinent to observe that both proving and disproving causation in cases where there is no straightforward link between the negligence act and the injury depend on an assessment of hypothetical situations. It is particularly so in cases where medical negligence is alleged on the ground of failure to obtain informed consent. In a surgical case, if a reasonable patient would have agreed to the proposed surgery even if informed of its risks, then the onus is on the patient to prove that, had he been so informed, he would have declined the surgery. According to the decision in Smith v. Barking, Havering and Brentwood HA [23], if everything points to the fact that a reasonable patent, properly informed, would have assented to the operation, a post-facto assertion by the patient that he would have acted otherwise, is not sufficient unless supported by additional factors. This was followed in SEM v. The Mid Yorkshire Hospitals NHS Trust [24], where it was admitted that the consultant had been negligent in failing to offer the patient an alternative to a hysterectomy, but the patient was unable to prove to the satisfaction of court that she would have opted for a less invasive form of treatment, if given a choice. In contrast, in O'Keefe v. Harvey-Kemble [25], court accepted that the patient would not have had breast augmentation surgery if she had been warned of the risks involved, while in Birch v. University College London Hospital NHS Foundation Trust [26], the judge accepted the patient's evidence that she would have opted for an MRI scan rather than a catheter angiography, had she been properly informed.

However, there have been cases where courts have given divided opinions, demonstrating how difficult it is to prove/disprove a causal connection between an error in the form of non-disclosure of risks and the injury sustained due to a surgery. In the Chester case (discussed earlier in relation to consent), the House of Lords by a 3-2 majority view, found the defendant surgeon liable, even though the negligence was only the failure to warn the patient of a small risk albeit of serious injury and whether the patient's decision to go ahead with the surgery would have been any different, had she known of such risk was not a matter which could be definitively assessed. Here, the patient only said that, had she known of the risk, she would have sought a second opinion, advice on alternatives, taken time to think it over (not agreed to the surgery at the time, but not ruling it out altogether, forever, either).

The decision followed the Australian case of Chapple v Hart [27], where the ENT surgeon who removed a pharyngeal pouch from the patient's oesophagus had not given prior warning of the risk of injury to the laryngeal nerve and consequent risk of partial or total loss of voice. Having suffered damage to the laryngeal nerve due to the surgery, the patient claimed that, had she been warned of the risk, she would have considered the possibility of having the surgery done by a more experienced surgeon at a later time. The judicial observations made in these cases suggest that both decisions were based on a patient's right to know, rather than a deliberate relaxation of the test of causation. Therefore, are surgeons expected to warn patients of every possible risk involved in an operation? Do patients really want to know every such detail? Does it make a difference to a patient's decision to undergo a particular surgery?

In the above context, the final decision in the South African case of Nicola McDonald v Dr Graham Wroe [28] offers a lifeline to surgeons. In this case, the patient claimed that the defendant surgeon had been negligent, because he had failed to offer her the option of a referral to a specialist maxillo-facial oral surgeon for the extraction of her wisdom teeth and to inform her of the risk of permanent nerve damage to her left inferior alveolar nerve. Although the original court held that there was a sufficient link between the non-disclosure of the risk of injury and the patient having actually had to suffer that injury, the High Court in appeal had this to say:

> *"The harm which the plaintiff suffered, is due to a risk which is inherent in the surgical procedure in question and which can ensue without negligence on the part of the practitioner, be it a general practitioner or a specialist, who performs the procedure. The harm which the plaintiff suffered, is harm she might equally probably have suffered in any event if the surgery had been performed by a specialist surgeon. There is, therefore, no direct causal link between the defendant's negligence (in failing to warn the plaintiff of the risk) and occurrence of the harm, unless it is shown that the plaintiff, upon being warned of risk, would not have undergone the procedure at all. That is not the plaintiff's case" [28].*

9) Other defences

There are a few other defences which may be useful in medical negligence litigation. For instance, the defence of contributory negligence can be raised in situations where a patient does not return to see the doctor on a scheduled date, does not adequately inform the doctor of the nature of symptoms or does not follow a treatment plan, etc. While there have been some cases in which this defence has served to reduce the liability of the doctor, there are many cases where it has also failed [29].

Furthermore, statutory limitations can provide a surgeon with a technical defence if a medical negligence lawsuit has been filed out of time. In Sri Lanka, legal action based on a personal injury claim by a private party (which includes medical negligence litigation) should be instituted within two years of the incident [30].

Conclusion

The several factors discussed above demonstrate the avenues available for a surgeon in constructing a defence case in medical negligence litigation. As much as it is good to be aware of these defences in the unfortunate and unpleasant event of having to face such litigation, this paper would be incomplete if the attention of the medical community is not drawn to some pointers on how to avoid litigation altogether. Of course, the first step is to avoid the occurrence of negligence itself. However, this is easier said than done. And it is particularly not for a lawyer as myself to venture into the territory of medical expertise and offer advice on how surgical errors could be prevented, though the common causes of negligence identified in numerous studies certainly help surgeons to learn from mistakes and prevent recurrence.

However, an area on which this paper can provide advice is how medical negligence litigation may be prevented, even if a surgeon has erred and an injury has resulted. As you may recall, not every surgical error reaches a court of law. Many socio-legal variables in Sri Lanka determine the trajectory of the journey from a medical mishap to medical negligence litigation. Research in this country has revealed that medical injuries turn into grievances for a variety of reasons such as the level of healthcare knowledge, access to information, extent of trust in doctors, awareness of rights, demographic traits of injured parties etc. [31]. Surgeons cannot obviously be in control of many of these factors. However, one aspect which does lie within the control of a surgeon is the doctor-patient relationship. Therefore, it would be safe to say that a surgeon in whom a greater level of trust is placed is more likely to be forgiven for his mistake, less likely to be sued for negligence.

Furthermore, not every aggrieved party will desire to make a claim of medical negligence. In this instance, socio-legal variables which affect grievance management – intensity of the injurious experience, nature of the relationship with the healthcare sector, response received from healthcare service providers in the aftermath of an adverse event, influence of third parties and perception of claiming – determine whether an injured party would consider making a claim against the doctor concerned [31].

Once again, a surgeon cannot be responsible for all of these variables, but if his post-incident conduct is dismissive or evasive, an injured party may be more likely to resort to making a claim against him. This is because it has been found that the main goal of making claims of medical negligence, including litigating is a desire to initiate an inquiry into the adverse incident and thereby prevent recurrence [32]. Therefore, it would be useful for surgeons to note that better communication skills with their patients, both before and after treatment, could reduce the probability of medical negligence litigation.

In conclusion, it is reiterated that, whilst everything possible should be done to avoid surgical errors, when such errors do happen, surgeons should be mindful of avenues to prevent medical negligence litigation, as well as the limits of defences available in law if medical negligence lawsuits are in fact instituted.

The author discloses no conflict of interest.

References

1. Sidaway v. Board of Governors of the Bethlem Royal Hospital and Maudsley Hospital [1985] AC 871
2. Pearce v. United Bristol Healthcare NHS Trust (1998) 48 BMLR 118 [CA]
3. Chester v. Afshar [2004] UKHL 41
4. Birch v. UCL Hospital Foundation Trust [2008] EWHC 2237 (QB)
5. Rogers v Whitaker (1993) ALJR 47 at 51
6. Reibl v. Hughes [1980] 2 SCR 880
7. Hopp v. Lepp [1980] 2 SCR 196
8. Haughian v. Paine (1987) 37 D.L.R. (4th) 624
9. Liyanage US. Applicability of the defence of informed consent against medical negligence in the scope of a patient's autonomy: A Sri Lankan perspective. Sri Lanka JIL 2008;(20) II; 117
10. Castell v De Greef (1994) 4 SA 408 (C)
11. Perera A. Medical Error and the Duty of Candour. Law College Law Review 2014; 127-140
12. Consent guidance in Good Medical Practice (2013). Available at: http://www.gmc-uk.org/guidance/ethical_guidance/consent_guidance_index.asp.
13. Okonkwo v. Medical and Dental Practitioners' Disciplinary Tribunal [1999] 9 NWLR (Pt 617) 1, cited in Iyioha, 90-91
14. Chatterton v. Gerson [1981] QB 432
15. Wells v. Surrey AHA The Times, 29 July 1978, cited in Jackson, 175
16. Lowrense v Oldwage [2004] 1 All SA 532 (C)
17. Jackson E. Medical Law: Text, Cases and Materials. 2nd edition. Oxford: Oxford University Press; 2010 (previous article)
18. Rogers SO, Gawande AA, Kwaan M, Puopolo AL, Yoon C, Brennan TA, Studdert DM. Analysis of surgical errors in closed malpractice claims at 4 liability insurers. Surgery 2006; 140: 25-33.
19. Prof. Priyani Soyza v. Rienzie Arsecularatne 2001(2) Sri.L.R.293
20. Hotson v. East Berkshire AHA[1987] 1 AC 750
21. Gregg v. Scott [2005] UKHL 2
22. Gouldsmith v. Mid Staffordshire General Hospitals NHS Trust [2007] EWCA Civ 397
23. Smith v. Barking, Havering and Brentwood HA [1994] 5 Med L.R. 285
24. SEM v. The Mid Yorkshire Hospitals NHS Trust [2006] EWCA Civ 643
25. O'Keefe v. Harvey-Kemble (1999) 45 BMLR 74 (CA)
26. Birch v. University College London Hospital NHS Foundation Trust [2008] EWHC 2237 (QB)
27. Chapple v Hart (1998) 195 CLR 232
28. Nicola McDonald v Dr Graham Wroe (2006) 3 All SA 565 (C)

29. Yule J. Defences in Medical Negligence: To what extent has Tort Law Reform in Australia limited the Liability of Health Professionals? JALTA 2011;4(1&2):53–63
30. Prescription Ordinance, No.22 of 1871, section 9
31. Perera A. Medical Negligence Claims in Sri Lanka. New Delhi: Har-Anand Publications; 2016
32. De Silva AP, Athukorala EAJR, De Silva STGR, Sivakumaran S. A descriptive study on the complaints of medical negligence received by the Ministry of Healthcare and Nutrition. Ceylon Medical Journal 2010; 55(1):31

TECHNICAL NOTE

Reconstruction of the common hepatic artery with right gastro-epiploic graft during Whipple procedure

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Key words : Whipples; arterial reconstruction; common hepatic artery

Introduction

During a Whipples pancreatico-duodenectomy it was found that the tumour was infiltrating into the common hepatic artery along a length of 2 cm (Figure 1).

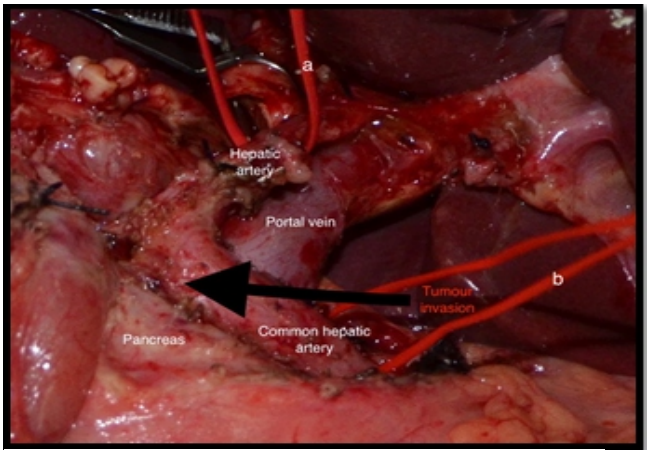

Figure 1. Pancreatic tumour invading the common hepatic artery

The artery was dissected proximally up to the coeliac axis and distally up to the origin of the left and right hepatic artery. A tumour free margin was defined and slung. The invaded segment was divided after placing fine bulldog clamps. A 3 cm segment of right gastroepiploic artery was dissected and harvested from its origin. Artery was flushed with heparin saline under pressure and dilated. The common hepatic artery was reconstructed with the harvested graft using interrupted 8/0 proline (Figure 2).

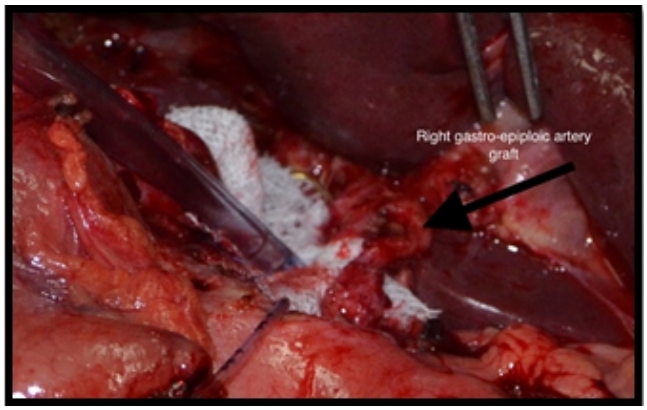

Figure 2. After reconstruction with right gastroepiploic artery graft

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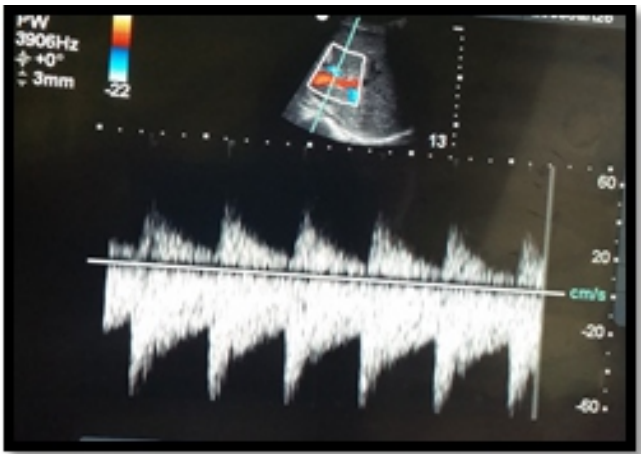

Figure 3. Tri-phasic Doppler flow in hepatic artery after reconstruction

The patient recovered unremarkably and was discharged.

Discussion

Vascular resection is demanding and beneficial in selected cases to achieve R0 resection [1] . It has been seen to increase the median survival compared to patients who undergo palliative bypass surgery [2] .

Partial wedge resection of the vascular wall is suitable when invasion of the blood vessel is less than 1/3 of the circumference. An artificial or autologous patch may be necessary for repair (3). End to end reconstruction can be done with smaller segment resections.

Previously extra anatomical reconstruction has been described in living donor liver transplantation using right gastroepiploic, right gastric, gastroduodenal, left gastric and splenic artery as the inflow . Similarly this case demonstrates the possibility of using the same as an interposition graft.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

References

1. Bockhorn M, Burdelski C, Bogoevski D, Sgourakis G, Yekebas EF, Izbicki JR. Arterial en bloc resection for pancreatic carcinoma. Br J Surg. 2011;98(1):86-92. https://doi.org/10.1002/bjs.7270
2. Gong Y, Zhang L, He T, Ding J, Zhang H, Chen G, et al. Pancreaticoduodenectomy combined with vascular resection and reconstruction for patients with locally advanced pancreatic cancer: a multicenter, retrospective analysis. PLoS One. 2013;8(8):e70340. https://doi.org/10.1371/journal.pone.0070340
3. Cheung TT, Poon RT, Chok KS, Chan AC, Tsang SH, Dai WC, et al. Pancreaticoduodenectomy with vascular reconstruction for adenocarcinoma of the pancreas with borderline resectability. World J Gastroenterol. 2014;20(46):17448-55. https://doi.org/10.3748/wjg.v20.i46.17448
4. Uchiyama H, Shirabe K, Taketomi A, Soejima Y, Ninomiya M, Kayashima H, et al. Extra-anatomical hepatic artery reconstruction in living donor liver transplantation: can this procedure save hepatic grafts? Liver Transpl. 2010;16(9):1054-61. https://doi.org/10.1002/lt.22119

BRIEF REPORT

Laparoscopic pancreatic resections: review of feasibility, safety and outcome

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Key words: Laparoscopy; pancreatico-duodenectomy; distal pancreatectomy

Abstract

Pancreatico-duodenectomy and distal pancreatectomy are the curative resections for pancreatic malignancies. Minimal access resections will reduce the exposure incision whilst facilitating resection with a clear vision.

However surgeon faces a challenging learning curve which is less steep for distal resection compared to pancreatico-duodenectomy. In laparoscopic pancreatico-duodenectomy resection and anastomosis will be done by laparoscopy. In laparoscopic assisted pancreatico-duodenectomy some or all the anastomoses are performed by a mini-laparotomy.

In the case series presented three distal pancreatectomies were performed without conversion. Twenty three out of thirty two (74%) pancreatico-duodenectomies were converted to open at various stages of resection. Five had complete mobilization, four had complete resection and mini-laparotomy anastomosis.

One out of the four had the hepatico-jejunostomy performed laparoscopically. He had a pancreatico-gastrostomy and gastro-jejunostomy by a mini-laparotomy with an incision of about 5cm. Early feeding and mobilization was possible with analgesic requirement being minimal.

Two patients died with in one month in the pancreatico-duodenectomy group recording a mortality of 6%. Except one all had clear resection margins on histo-pathology with lymph node clearance comparable to open surgery. In units performing open pancreatic surgery and conversant with advanced laparoscopy, going through the learning curve for laparoscopic pancreatic surgery is feasible and safe. To compare benefits over the open procedures warrant further recruitment of patients.

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Introduction

Surgical resection is the treatment for pancreatic malignancies for resectable tumours, Pancreatico-duodenectomy (PD) or distal pancreatectomy (DP). PD is associated with a significant morbidity and occasional mortality (1) which are comparatively less with DP.

Minimal access resection will minimize the incision and provide a better vision during surgery by magnification and zooming (8) with reduced blood loss (2,3,4,5,9).

In PD anastomoses may be done laparoscopically or using a "mini" incision, as a laproscopic assisted procedure (LAPD) (4). The duration of surgery compared to open, is more in Laparoscopic pancreaticoduodenectomy(LPD) (2) whilst similar in distal resections (9). The learning curve is less steeper for distal resections (6).

The morbidity in laparoscopic resections are reported as similar to open(2,9) Laparoscopic pancreatic surgery involves a challenging learning curve and literature indicate further studies to recommend it's routine use (2,5,7,9). This case series provide a discussion on laparoscopic pancreatic resections, in a tertiary care center, in view of feasibility and outcome.

Patients and method

All patients undergoing laparoscopic pancreatic resections for a period of 3 years were included in this review.

Laparoscopic assisted pancreatico-duodenectomy(LAPD)

Patients were operated in supine position with 30^0 head up and a tilt towards left. The legs were in abduction. Five ports were used. In the patients who underwent a complete resection anastomoses were performed by a mid line "mini"laparotomy.

Laparoscopic distal pancreatectomy(LDP)

The surgery was performed in right lateral position with a head up tilt. Five ports were used. In all spleen was removed en-bloc and the resected specimens were retrieved using a bag, fashioned with a "urinary catheter bag".

Results

Details are discussed separately for both surgeries.

Pancreatico-duodenectomy

A total of thirty two patients underwent LAPD. In twenty three patients procedure was converted to open for completion of resection. Decision to open was made when the surgery is stagnant to the subjective feeling of the surgeon. In five patients the mobilization was completed laparoscopically but due to shortage of endostaplers laparotomy done for required division of organs.

In four patients who had resection laparoscopically anastomoses were performed by mid line laparotomy. In one of them hepatico-jejunostomy was performed laparoscopically requiring a mini-laprotomy of 5cm. In other three the incision was about 10cm.

Stay in intensive care unit ranged from 48 to 96 hours. Two patients were readmitted to ICU with complications. On the first two post operative days pain was managed with epidural Bupivacain and subsequently with diclofenac suppositories and oral analgesics.

Two patients readmitted to ICU with sepsis needed ventilation and passed away making the mortality of the series 6%. In thirty one patients the resection margins were clear and in one the margin was involved at the pancreatic resection margin. The lymph node removed ranged from 8-14.

Distal pancreatectomy

Three patients were operated, completed laparoscopically, without conversion. Non required ICU. Analgesic requirements were low, all being started on oral feeding and mobilized from next day. There were no complications and all discharged by six days. The resection margins were clear in all.

Discussion

Laparoscopic pancreatic resections pose a challenging learning curve (2,5,6,8). Due to it's complexity LPD and LAPD are more challenging than LDP (8). This was evident in our series with all distal resections being completed laparosocpically whilst in LAPD 23 out of 32 had conversion prior to complete mobilization and or resection.

Regarding LAPD, the literature review by Gagner et al in 2009 of 146 surgeries, reports a conversion rate of 46%.(3) In our series 23 out of 32(74%) were converted to open at various stages of resection. The experience our unit had in open pancreatic surgery, laparoscopy and observing videos on laparoscopic PD were useful to go through the learning curve. When the progress was slow a timely decision to open was made. At laparotomy, we identified the reasons for lack of progress. In the patients who had complete resection the incision size was smaller. Our incision size ranged from 6-10cm compared to a mean size of 5.2cm reported in a study. The patient who underwent laparoscopic resection and laparoscopic hepatico-jejunostomy had an incision of 5cm.

The efficacy of laparoscopy over open surgery to obtain clear resection margins and adequate lymph node harvest has different results in published series(5,8). In our series results are similar in both techniques.

LDP-All three patients who underwent LDP were completed laparoscopically. Literature indicate less blood loss and short post operative stay in laparoscopic distal pancreatectomy whilst mean operative time and overall morbidity reported equal . These facts were evident in our patients.

Conclusions

Laparoscopic pancreatico-duodenectomy involves a steep and stretched out learning curve. Conversion to open surgery may be required until experience is gained. In units performing open procedure and conversant with advanced laparoscopy, going through this learning curve is feasible and safe. In contrast acquiring competency in distal pancreatectomy is less demanding. To compare benefits over the open procedures warrant further recruitment of patients.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

References

1. Dirk J. Gouma, Rutger C. I. van Geenen,Thomas M. van Gulik, Rob J. de Haan, Laurens T. de Wit,Olivier R, C. Busch,Huug Obertop.Rates of Complications and Death After Pancreaticoduodenectomy: Risk Factors and the Impact of Hospital Volume. *Ann Surg.* Dec 2000; 232(6): 786–795. https://doi.org/10.1097/00000658-200012000-00007
2. Asbun HJ1, Stauffer JA.Laparoscopic vs open pancreaticoduodenectomy: overall outcomes and severity of complications using the Accordion Severity Grading System. *J Am Coll Surg*. 2012 Dec;215(6):810-9. doi: 10.1016/j.jamcollsurg.2012.08.006. Epub 2012 Sep 19. https://doi.org/10.1016/j.jamcollsurg.2012.08.006
3. Gagner M, Palermo M.Laparoscopic Whipple procedure: review of the literature J HepatobiliaryPancreat Surg. 2009;16(6):726-30. doi: 10.1007/s00534-009-0142-2. *Epub* 2009 Jul 28. https://doi.org/10.1007/s00534-009-0142-2
4. Dulucq JL, Wintringer P, Stabilini C, Feryn T, Perissat J, Mahajna A. Are major laparoscopic pancreatic resections worthwhile? A prospective study of 32 patients in a single institution.*SurgEndosc*. 2005 Aug;19(8):1028-34. Epub 2005 May 26 https://doi.org/10.1007/s00464-004-2182-7

5. Lei P, Wei B, Guo W, Wei H. Minimally Invasive Surgical Approach Compared With Open Pancreaticoduodenectomy: A Systematic Review and Meta-analysis on the Feasibility and Safety.*Surg Laparosc Endosc Percutan Tech*. 2014 Apr 16. [Epub ahead of print]
https://doi.org/10.1097/SLE.0000000000000054
6. Tan-Tam C, Chung SW.Minireview on laparoscopic hepatobiliary and pancreatic surgery. *World J Gastrointest Endosc*. 2014 Mar 16;6(3):60-67.
https://doi.org/10.4253/wjge.v6.i3.60
7. Bao PQ1, Mazirka PO, Watkins KT.Retrospective Comparison of Robot-Assisted Minimally Invasive Versus Open Pancreaticoduodenectomy for Periampullary Neoplasms. *J Gastrointest Surg*. 2013 Nov 15. [Epub ahead of print]
8. Zenoni SA1, Arnoletti JP2, de la Fuente SG2.Recent developments in surgery: minimally invasive approaches for patients requiring pancreaticoduodenectomy. *JAMA Surg*. 2013 Dec;148(12):1154-7. doi: 10.1001/jamasurg.2013.366.
https://doi.org/10.1001/jamasurg.2013.366
9. Zhang M, Fang R, Mou Y, Chen R, Xu X, Zhang R, Yan J, Jin W, Ajoodhea H. LDP vs ODP for pancreatic adenocarcinoma: a case matched study from a single-institution. *BMC Gastroenterol*. 2015 Dec 22;15(1):182. doi: 10.1186/s12876-015-0411-2.
https://doi.org/10.1186/s12876-015-0411-2
10. KB Galketiya, MVG Pinto, Analysis of resection margins and lymph node dissestion in laparoscopic assisted pancreatico-duodenectomy. International Journal of Scientific and Research Publications February 2015;5(2)

Unusual Presentation of Pheochromocytoma as CVA

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Keywords: Pheochromocytoma; stroke; CVA; young patients

Abstract

Pheochromocytomas are catecholamine secreting enterochromaffin tumours causing paroxysmal hypertension. Our patient was a young boy who presented with cerebral haemorrhage. Sometimes diagnosing them can be difficult, due to overlapping with other conditions such as myocardial ischemia, baroreflex failure, migraine, panic disorder arrhythmias, hyperthyroidism, carcinoid tumours and stroke. This patient is of clinical interest as pheochromocytoma presented with life-threatening cerebro vascular attack.

Introduction

Pheochromocytomas are catecholamine secreting enterochromaffin tumours causing paroxysmal hypertension. The symptom triad is of headaches, diaphoresis and palpitations.

The cerebral manifestations of pheochromocytoma are uncommon [1]. Due to its variable clinical presentation, pheochromocytomas have been called "the masquerader". We describe a patient presenting with loss of consciousness in which the initial working diagnosis was cerebral haemorrhage due to hypertensive bleed. During the work-up, ultrasonography revealed an adrenal mass. MRI, urinary metanephrine and nor-metanephrine levels confirmed the diagnosis of pheochromocytoma.

Case Report

A 21-year old male presented to the emergency department in an unconscious state with a history of loss of consciousness for 2 hours. On evaluation, the patient had a Glasgow Coma Scale (GCS) score of 8; E2V2M4. The blood pressure was 200/140 mmHg on repeated recordings. Physical examination revealed plantar extension of the feet with exaggerated deep tendon reflexes and hypertonia. Non Contrast Computed Tomography (NCCT) of the head revealed a large cerebral haemorrhage in the left capsule-ganglionic region with intraventricular extension and mass effect (Figure 1).

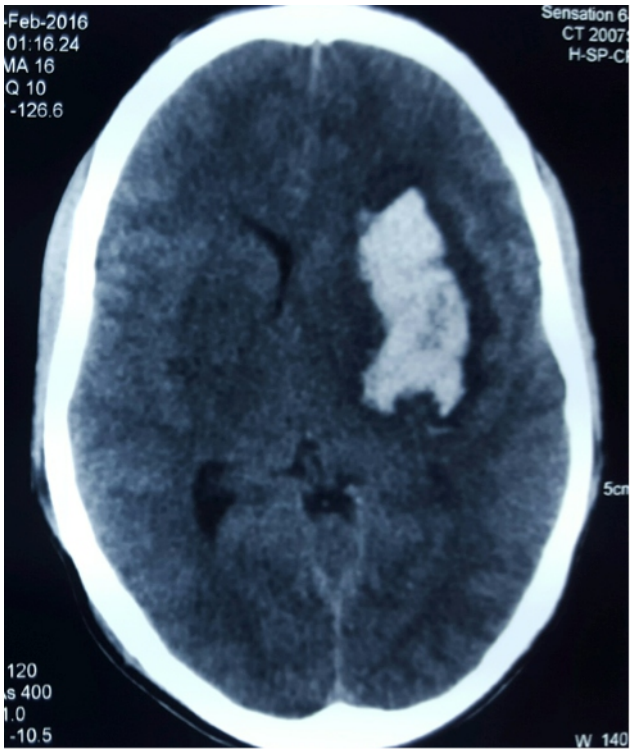

Figure 1. Large blood attenuation hyper density ~ 5 X 4.3 X 2.8 cms in left capsule- ganglionic region with intraventricular extension and mass effect.

The Patient was intubated and then managed on the lines of an Acute Cerebro vascular Attack (CVA). An ultrasound scan of the abdomen revealed a well-defined heterogeneous solid mass at the upper pole of right kidney, suspicious of an adrenal lesion. There was also left hydroureteronephrosis and a left renal calculus (10 mm in upper calyx). NCCT and MRI abdomen (figure 2) a showed soft tissue density lesion in the right adrenal, measuring 5.5 x 3.4 cms. After the initial management and confirmation of diagnosis, the patient was started on Prazosin (alpha blocker) 10 mg twice daily, telmisartan 40 mg and hydrochlorothiazide 12.5 mg twice daily. A week later, beta-blocker labetalol infusion was started along with Amlodipine 10 mg twice daily and clonidine

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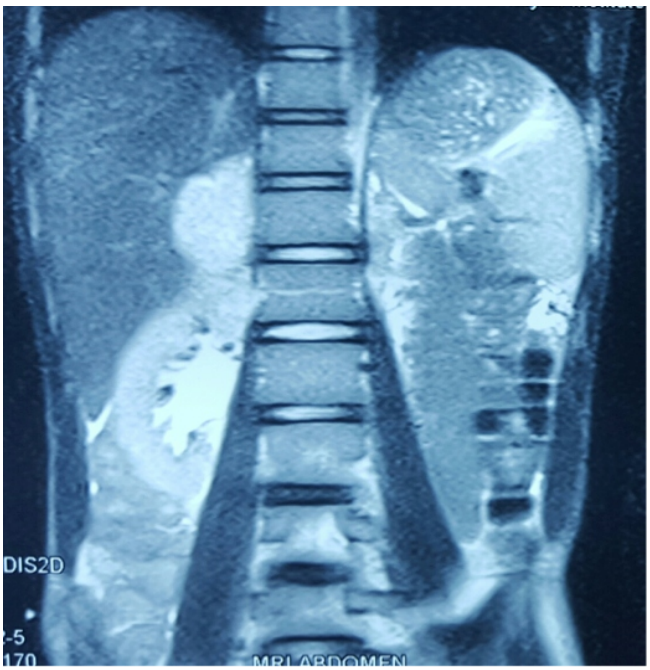

Figure 2. T2 weighted MRI delineating intensely enhancing well-defined right adrenal mass of 5.2 X 3.7 cms

0.2mg four times daily as the pressures were still uncontrolled. Urine metanephrine and nor-metanephrine levels were elevated to more than 10 times the normal limit, suggesting pheochromocytoma. After medical stabilization and adequate BP control, the patient underwent a right adrenalectomy.

The post-operative period was uneventful. He gradually regained consciousness and the GCS score was 15, with a residual right hemiparesis. The blood pressure gradually settled and was managed with oral anti-hypertensive Prazosin 5 mg once daily. The 24-hour urine metanephrine and nor-metanephrine levels were repeated after 2 weeks and 3 months post surgery, which were within normal limits. The patient is doing well at 8 months follow up and has right hemiparesis, which is gradually improving.

Discussion

The clinical variations of pheochromocytoma is well known and sometimes diagnosing them can be difficult, due to overlapping with other conditions such as myocardial ischemia, baroreflex failure, migraine, panic disorder arrhythmias, hyperthyroidism, carcinoid tumours and stroke [2,3]. The incidence of pheochromocytoma in the general population is 0.8 per 100 000. It is often not diagnosed accurately or managed by many internists, endocrinologist and nephrologists [4]. In a recent review Cook and Loriaux stated that hormone screening for adrenal tumours should be "tailor made" for the clinical context [5]. Our patient was a young man whose pheochromocytoma induced a cerebral haemorrhage, presenting as a stroke.

Cerebral haemorrhage secondary to pheochromocytoma is rare and the incidence is unknown. The condition is partially or completely reversible in some patients. First, hypertension alone can cause cerebral infarction in patients who have pheochromocytoma [6]. During hypertensive crises, the combination of cerebrovascular auto regulation failure and very high blood pressure can cause hypertensive encephalopathy [7]. Other possible mechanism may be endothelial dysfunction due to circulating toxins or chemotherapy agents. There may be cerebral infarction or haemorrhage due to compromise of the microcirculation by pressure from surrounding vasogenic edema [8].

Definitive management of a pheochromocytoma is surgical removal, which is curative in up to 90% cases. Our patient is of clinical interest as pheochromocytoma presented with a life-threatening cerebro vascular attack. This unusual case has been described to increase awareness of the life-threatening manifestations of pheochromocytoma. The clinician must have a high index of suspicion to diagnose and manage these cases.

References

1. Hinchey J, Chaves C, Appignani B, Breen J, Pao L, et al. (1996) A reversible posterior leukoencephalopathy syndrome. *N Engl J Med* 334: 494-500. https://doi.org/10.1056/NEJM199602223340803
2. Manger WM (2006) Diagnosis and management of pheochromocytomas—recent advances and current concepts. *Kidney Int* 70 (suppl): S30–S35 https://doi.org/10.1038/sj.ki.5001974
3. 2 Mittendorf EA et al. (2007) Pheochromocytoma: advances in genetics, diagnosis, localization, and treatment. *Hematol Oncol Clin North Am* 21: 509–525 https://doi.org/10.1016/j.hoc.2007.04.012
4. Golden S, Robinson K, Saldanha I et al. Prevalence and incidence of endocrine and metabolic disorders in the United States: a comprehensive review. *J Clin Endocrinol Metab* 2009; 94: 1853–1879. https://doi.org/10.1210/jc.2008-2291
5. Cook DM, Loriaux DL. The incidental adrenal mass. *Am J Med* 1996;101:88-94 https://doi.org/10.1016/S0002-9343(96)00082-4
6. Lehmann FS, Weiss P, Ritz R, Harder F, Staub JJ. Revers- ible cerebral ischemia in patients with pheochromocytoma. *J Endocrinol Invest* 1999;22:212-4. https://doi.org/10.1007/BF03343544
7. Goswami R, Tandon N, Singh B, Kochupillai N. Adrenal tumour, congestive heart failure and hemiparesis in an 18- year-old male. A clinical-pathological conference. *Int J Car- diol* 1995;49:233-8. https://doi.org/10.1016/0167-5273(95)02302-D
8. McKinney AM, Sarikaya B, Gustafson C, Truwit CL (2012) Detection of microhemorrhage in posterior reversible encephalopathy syndrome using susceptibility-weighted imaging. *AJNR Am J Neuroradiol* 33: 896-903. https://doi.org/10.3174/ajnr.A2886

- **Key Points**
- Though there is the symptom triad of headaches, diaphoresis and palpitations for pheochromocytoma, rarely cerebral ischaemia and stroke symptoms can also be the presenting features in patients who have pheochromocytoma .
- Diagnosis of pheochromocytoma can be difficult at times, as the symptoms often overlap with other conditions such as hyperthyroidism, carcinoid tumors, myocardial ischaemia etc.
- Cerebral haemorrhage is partially or completely reversible in patients of pheochromocytoma.

Tricobezoar - a rare cause for chronic epigastric pain

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Keywords: trichobezoars; trichotillomania; trichophagia; epigastric pain

Introduction

Persisting swallowed foreign materials within the gastrointestinal tract are known as bezoar and they are most commonly found in the stomach [1]. Tricobezoar is a mass formed with ingested hair, food and mucus which is almost invariably associated with trichotillomania and trichophagia.

Case report

A 13 year old girl was admitted to surgical casualty with one week duration of aching type epigastric pain. It was non radiating constant pain associated with nausea, occasional vomiting and loss of appetite.

She had intermittent partial relief of pain in between meals, but worsening of pain within few minutes of eating which has compelled her to ingest progressively smaller meals. She didn't have dysphagia, odynophagia or reflux of food. Her bowel habits remained normal. She also had increase sleepiness and exertional dyspnoea.

She had similar episodic abdominal pain for past eight months, treated by general practitioners as for gastritis with symptomatic improvement.

Six months back she cut her hair short by herself and had started eating the remaining hair. Her behaviour has been otherwise normal and she hasn't neglected daily routine other than reduced interest in academic work.

She was treated by a psychiatrist for this unusual habit and associated abdominal pain. Her academic performances at school were satisfactory until around the beginning of her episodic abdominal pain, where she had gradually started to neglect her school work. She is the elderly child in a family of two children.

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On examination she was pale and mildly dehydrated. She had very shortly cut hair. Apart from epigastric tenderness abdominal examination was unremarkable.

Her haemoglobin was 5.6g/dl and other biochemical investigations were normal. Upper GI endoscopy was performed and tricobezoar was found in her stomach. The duodenum was free of hair [Figure 1].

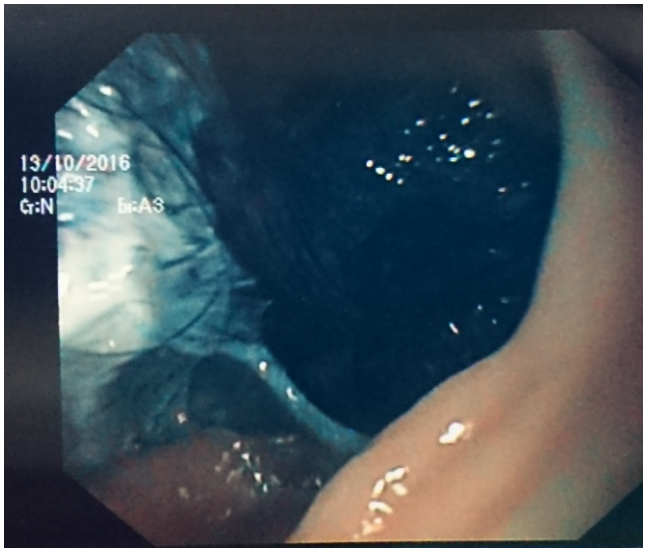

Figure 1. Tricobezoar during endoscopy.

Patient underwent mini laparotomy after optimizing haemoglobin. Tricobezoar was removed and she made an uneventful post-operative recovery [Figure 2, 3].

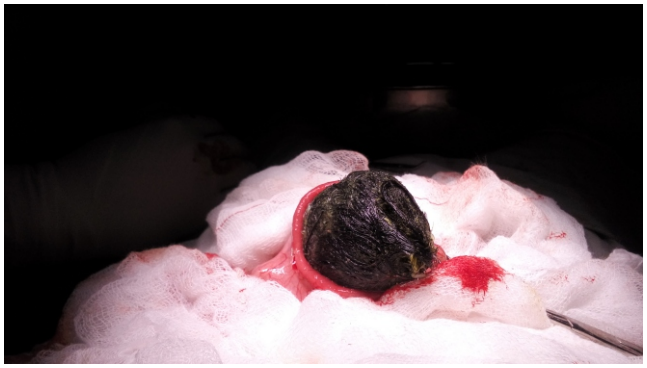

Figure 2. Intra operative view.

Figure 3. Removed Tricobezoar

Discussion

The bezoars are classified depending on the ingested material. Phytobezoars are formed with undigested food from vegetables and fruits, trichobezoars are derived from ingested hair, lactobezoars are from undigested milk protein and pharmacobezoars are derived from concretions of various medications [1].

Trichotillomania which means pulling out one's own hair and swallowing of hair known as trichophagia [2] lead to trichobezoars formation. These are psychiatric conditions of unknown etiology, usually seen in young girls and associated with other conditions like depression, anxiety and eating disorders [2]. It is estimated 20% of patients with trichotillomania also have trichophagia and 30% of them will develop tricobezoar [2].

As observed in this patient the initial presentation is with nonspecific symptoms like nausea, vomiting, epigastric pain and early satiety [1, 2 and 3]. In female patients, history of trichotillomania /trichophagia, alopecia patches are important clues [1] in diagnosis of tricobezoar. Some patients may have mobile epigastric mass and halitosis [1].

Complicated cases can present with gastric outlet obstruction, obstructive jaundice or/and pancreatitis due to passage of bezoar to duodenum, malabsorption, ulceration, perforation or intussusception [1, 2]. Severe anaemia found in this patient is another known complication of tricobezoar [1].

In some cases the mass extends beyond the stomach in to duodenum known as the Rapunzel Syndrome [3, 4]. Upper GI endoscopy is the diagnostic investigation [1]. Abdominal X ray and ultrasound scan have variable sensitivity and may suggest the presence of an abdominal mass, if they were being done as investigations for nonspecific symptoms [2].

Open surgery and extraction is the usual mode of removing the tricobezoar as it is technically easy, have low rates of complications, 100% success rate and enables complete assessment of small bowel for other areas of bezoar [3, 5]. Laparoscopic approach has long duration of surgery due to complexity of procedure, risk of contamination and less success rates [5]. Small bezoars may be endoscopically extracted but overall success is around 5% [5].

References

1. Katharine Eng, Marsha Kay, Gastrointestinal Bezoars: History and Current Treatment Paradigms. Gastroenterology and Hepatology journal - 2012 Nov; 8(11): 776–778. Available from : http://www.ncbi.nlm.gov/pmc /article /PMC 3966178/
2. Marek Wolski1, Marta Gawłowska - Sawosz, Michał Gogolewski, Tomasz Wolańczyk, Piotr Albrecht, Andrzej Kamiński : Trichotillomania, trichophagia, trichobezoar – summary of three cases. Endoscopic follow up scheme in trichotillomania; *Psychiatr. Pol*. 2016; 50(1): 145–152. https://doi.org/10.12740/PP/43636
3. Manish Jain, Sohan Lal Solanki, Ankur Bhatnagar, Pavan Kumar Jain. An Unusual Case Report of Rapunzel Syndrome Trichobezoar in a 3-Year-Old Boy. *International Journal of Trichology.* 2011 Jul-Dec; 3(2): 102–104. https://doi.org/10.4103/0974-7753.90820
4. Veena Gonuguntla, Divya-Devi Joshi; Rapunzel Syndrome: A Comprehensive Review of an Unusual Case of Trichobezoar. *Clinical Medical Research.* 2009 Sep; 7(3): 99–102. https://doi.org/10.3121/cmr.2009.822
5. R. R. Gorter, C. M. F. Kneepkens, E. C. J. L. Mattens, D. C. Aronson; Management of trichobezoar: case report and literature review, *Pediatric Surgery International.* 2010 May; 26(5): 457–463. https://doi.org/10.1007/s00383-010-2570-0

- **Key Points:**
- Tricobezoars are almost exclusively seen in females and should be suspected in young females with unusual abdominal pain and behavioural changes.
- It is a rare cause for variety of gastrointestinal complications and chronic pain.
- Endoscopic approach has high failure rates and open surgery is the most feasible option.

Incidental diagnosis of an adrenal myelolipoma: case report

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Keywords: Adrenal tumour; myelolipoma; adrenalectomy

Introduction

Adrenal myelolipomata are rare tumours. A myelolipoma was first reported by Gierke in 1905, and Oberling defined the lesion as myelolipomatoses in 1929 [1]. These lesions were usually detected incidentally, or when symptomatic due to massive growth or hormonal activity. However, the routine use of non-invasive imaging techniques has made incidental diagnosis more common [2].

Case report

A 58-year-old male was investigated for dyspeptic symptoms. He was a diabetic and hypertensive on treatment. Examination was unremarkable. Abdominal ultrasonography showed a large hyperechoic mass in the right suprarenal gland. Abdominal contrast-enhanced CT scan (CECT) revealed a mass with heterogeneous attenuation measuring 11.48 × 8.27 cm (Figure 1) suggestive of a right adrenal myelolipoma.

Serum aldosterone, serum renin and 24 hour urine metanephrine levels were within normal limits indicating the tumour was non-functional. Dehydroepiandrosterone sulphate (DHEAS) levels were not done.

Though asymptomatic, in view of the size of the lesion surgery was recommended. An open transperitoneal right adrenalectomy was performed via a right subcostal incision (Figure 2).

The specimen consisted of a globular soft tissue mass measuring 13 × 9.5 × 7 cm and weighing 500 g. It had yellow and fatty myxomatous areas and microscopic evaluation revealed a mass composed of mature adipose tissue with haematopoietic cells.

The postoperative recovery was uneventful and he was well more than a year after surgery.

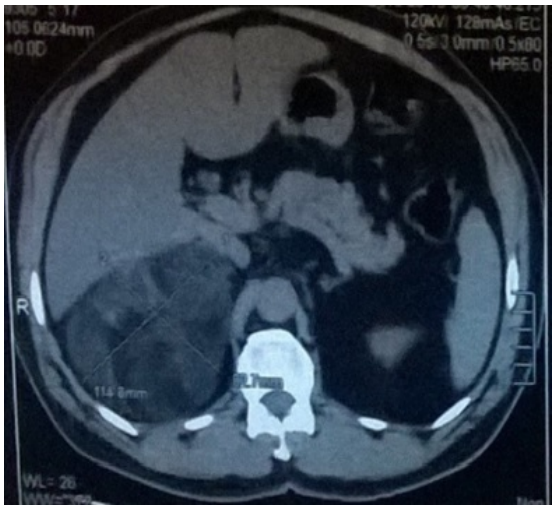

Figure 1. CECT abdomen showing heterogeneous right adrenal lesion

Discussion

The first operated case of a myelolipoma was reported by Dyckman and Freedman in 1957 . The lesions described were usually less than 4 cm in diameter while the largest reported tumour weight was 6 kg [3]. Their incidence ranged from 0.08% to 0.4% with involvement of the right adrenal being more common than the left [4].

It is believed that adrenocortical cell metaplasia occurs in these lesions due to stimuli such as inflammation, necrosis, stress or infection [5]. Associations noted with adrenal myelolipomata such as obesity, hypertension and diabetes were present in this patient [6]. They have a relatively slow growth rate with a doubling time of 4.6 to 95.1 months [5].

The commonest symptom is abdominal pain due to tumour haemorrhage, necrosis or compression of adjacent organs [2]. Though usually non-functional, more than 25 cases of endocrine dysfunction associated with myelolipomata have been reported before 2004 [7]. There is a 10% incidence of associated endocrine conditions such as Conn's syndrome, Cushing's disease and diabetes. There is no potential for malignancy [8].

More than 90% of adrenal myelolipomata are effectively

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diagnosed by imaging, including ultrasonography, CECT and magnetic resonance imaging (MRI). A CT demonstrating a threshold value of 10 Hounsfield units has a 98% specificity and 71% sensitivity for identifying lipid rich adenomas associated with the adrenal gland [9].

Small (< 5cm), asymptomatic lesions should be observed over a period of 1-2 years [6]. Surgical resection is reserved for symptomatic or larger (> 5cm) lesions at risk of spontaneous rupture, retroperitoneal haemorrhage and life threatening shock. Laparoscopic adrenalectomy is fast becoming the standard of care though open surgery is appropriate for large lesions as in this case [8]. Early control of the short right adrenal vein is an important step in surgery to prevent significant haemorrhage (Figure 2).

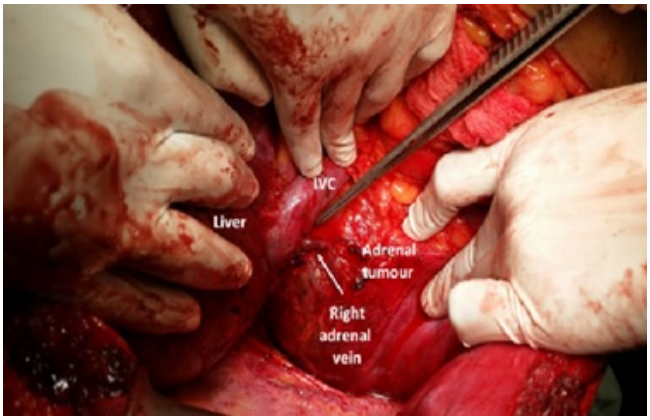

Figure 2. Intra-operative demonstration of right adrenal vein

Conclusion

Myelolipomas are often incidentally diagnosed adrenal tumours that are usually non-functional and have no malignant potential. Evaluation is by cross sectional imaging and biochemical assessment to exclude secretory function. The majority can be observed without intervention. Surgery is indicated when symptomatic and in large tumours with a potential for spontaneous rupture and major haemorrhage.

References

1. Lawler L, Pickhardt P. Giant adrenal myelolipoma presenting with spontaneous hemorrhage. CT, MR and pathology correlation. *Irish medical journal*. 2001;94(8):231-3.
2. Daneshmand S, Quek ML. Adrenal myelolipoma: diagnosis and management. *Urology journal*. 2009;3(2):71-4.
3. Akamatsu H, Koseki M, Nakaba H, Sunada S, Ito A, Teramoto S, et al. Giant adrenal myelolipoma: report of a case. *Surgery today*. 2004;34(3):283-5.. https://doi.org/10.1007/s00595-003-2682-4
4. Porcaro A, Novella G, Ficarra V, Cavalleri S, Antoniolli S, Curti P. Incidentally discovered adrenal myelolipoma. Report on 3 operated patients and update of the literature. Archivio italiano di urologia, andrologia: organo ufficiale [di] Società italiana di ecografia urologica e nefrologica/Associazione ricerche in urologia. 2002;74(3):146-51.
5. Meyer A, Behrend M. Presentation and therapy of myelolipoma. International Journal of Urology. 2005;12(3):239-43. https://doi.org/10.1111/j.1442-2042.2005.01034.x
6. Tyritzis SI, Adamakis I, Migdalis V, Vlachodimitropoulos D, Constantinides CA. Giant adrenal myelolipoma, a rare urological issue with increasing incidence: a case report. *Cases journal*. 2009;2(1):1. https://doi.org/10.4076/1757-1626-2-8863
7. Hisamatsu H, Sakai H, Tsuda S, Shigematsu K, Kanetake H. Combined adrenal adenoma and myelolipoma in a patient with Cushing's syndrome: case report and review of the literature. *International Journal of Urology.* 2004;11(6):416-8. https://doi.org/10.1111/j.1442-2042.2004.00815.x
8. Puneet TS, Singh S, Kumar M, Shukla V. Adrenal myelolipoma: a case report. The Internet Journal of Third World Medicine. 2006;3.
9. Willatt JM, Francis IR. Radiologic evaluation of incidentally discovered adrenal masses. *American family physician.* 2010;81(11):1361-6

Key Points:

- Evaluation by cross sectional imaging and biochemical assessment to exclude secretory function is important in the assessment of adrenal myelolipomata
- Surgery should be considered in large tumours with a risk of spontaneous rupture and haemorrhage

A young boy with unusual foot lump (madura foot)

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Keywords: Madura foot; eumycetoma; acinomycetoma; fungal grain; diagnostic management

Introduction

Mycetoma is a debilitating gradually progressing chronic infectious disease affecting skin and subcutaneous tissue. Gill first described this condition in India as "Madura Foot" in 1842. Carter initiated using the terminology "Mycetoma" in 1860.

Mycetoma when caused by true fungi it is known as eumycetoma and that is caused by microaerophilic actinomycetes is known as actinomycetoma. Geographical distribution of Mycetoma reveals endemic pattern in tropical and subtropical areas [1]. It remains as a real cause of disability among population living in rural agricultural area as it is often neglected in the initial stage. Early identification and intervention gives good result.

Case report

18 years old boy presented with large lump in his right side sole for three years duration. It was which progressively increasing in size, with associated yellow colour fluid discharge from the surface of lump. On examination there was a large 10 X 15 cm irregular protruding growth over anterior two thirds of the sole which was indurated and has multiple nodular areas with sinus tracts (Figure 1).

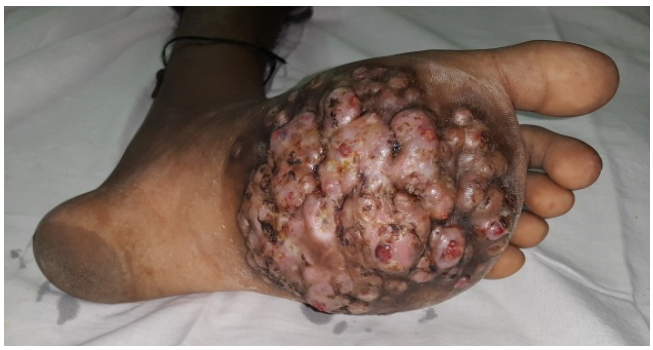

Figure 1. Myecetoma involving the anterior half of sole in right

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The excision biopsy from the lesion showed chronic inflammatory process with multiple granules in tissues, which supported the diagnosis of mycetoma infection.

MRI scan revealed a 10 cm x 8cm large soft tissue mass in sole of right foot with "dot in circle" sign and osteomyelitis changes in 2nd to 4th metatarsal bones (Figure 2).

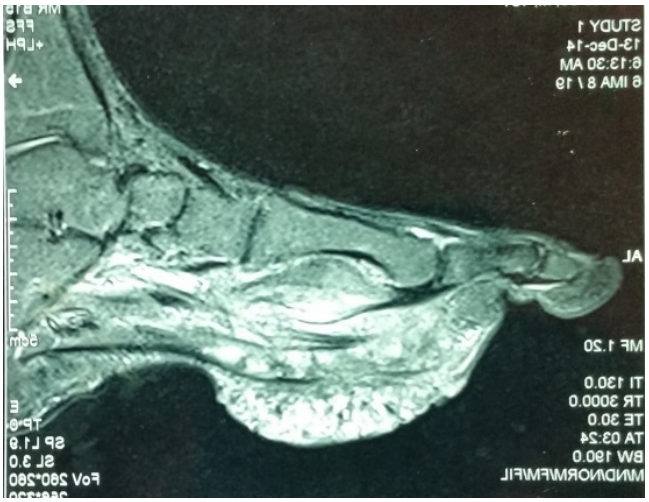

Figure 2. The MRI scan shows the soft tissue lump in sole suggestive of Madura foot

There were no abnormalities in routine blood investigations. He was treated with antifungal drugs (itraconazole and cotrimoxazole) for three months duration as advised by dermatologist. One month after commencing the treatment, a wide local excision of lump was carried out in collaboration with plastic surgical team.

The histology specimen showed the chronic inflammatory areas with central granules exhibiting radiating filamentous materials. These granules were rimmed by neutrophils and foreign body type giant cells. These features were compatible with a clinical diagnosis of Madura foot.

H&E staining appearance could result from infections due to mycetoma infection. A skin graft was performed to the excision site and the patient had a good healing (Figure 3).

The patient was then given the remaining course of treatment and was advised to take long term with itrconazole.

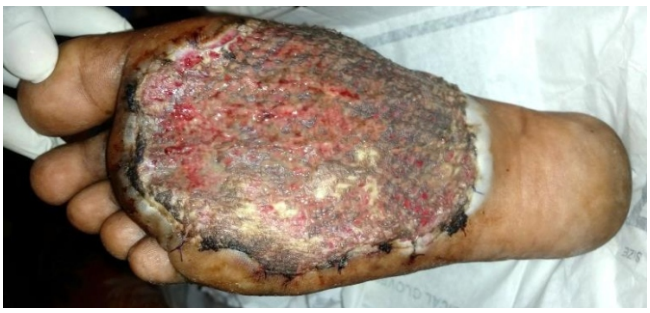

Figure 3. Picture shows skin graft after excision of lump

Discussion and conclusions

40% of Mycetoma infection is due to eumycetoma. 30 different species are known to cause mycetoma infection. Actinomadura madurae has been the most common causative species among actinomycetoma. Madurella mycetomatis has been the most common causative species among eumycetoma and is an important infective species globally [1]

Although Mycetoma can affect patients at any age yet the peak age incidence lies between the age 20 and 40. Foot infection by Mycetoma is the most common site (68.7%) of infection in human body. Pathogens get access to skin from soil via superficial abrasions or lacerations [1]. The incubation period for the Mycetoma infection is around three months [4]. Agricultural workers, farmers and those who don't use footwear are prone to get infection. Males are affected more than females (male to female ratio of 5:1) probably because of the occupational exposure [1].

The clinical triad characterizing Mycetoma infection are chronic induration (subcutaneous mass), draining sinuses, and discharge of granules [1]. The disease can be staged from A to D based on the worsening clinical manifestations. When there is swelling with no sinuses it would be stage A and the development of woody induration with sinuses is stage B. Bone involvement is stage C and the spread to other sites and multiple lesions is stage D [4]. There are reports about the remote possibility of regional lymph node spread [1].

Different types of imaging modalities used to identify the extent of tissue involvement. Based on the X-ray findings the extent of Mycetoma infection has been staged from 0 to stage VI (0 -no bone involvement and stage VI - multiple rays and multiple bone involvement) [5]. Mycetoma Skin, Muscle, Bone Grading System (MSMBS), is an MRI diagnosis of extent of Mycetoma infection in respective tissues [6].

Grains varying in physical properties could be demonstrated from the sinuses. They can be identified by haematoxylin and eosin (H&E) staining and can aid at identification of organism. A Gram stain is useful for detecting actinomycetoma and Periodic acid-Schiff (PAS) staining is useful to detect eumycetoma [3].

Culture methods are the gold standard to identify species of mycetoma responsible for infection. It is time consuming and can also have contamination. Further some species can't be identified by morphology alone [1]. Appropriate molecular diagnostic procedures would aid to identify the causative agent of Mycetoma. A specific PCR test was designed to amplify a region of ribosomal gene complex. Species identification becomes possible with post amplification restriction digestion technique [1].

Treatment type and response differ between actinomycetoma and eumycetoma. As such it is a prerequisite to identify the correct species for effective treatment. Eumycetoma is better treated with adequate antifungal therapy and surgery. Actinomycetoma usually responds well to antibiotics and surgery will be needed in few selected cases. The best outcome could be expected for an early well encapsulated lesion without bone involvement, by combining medical treatment before and after surgery [1].

The treatment of advanced mycetoma infection usually needs long term antimicrobial treatment. The side effects of drugs and the possibility of relapse of infection will have to be borne in mind during follow up [1].

References

1. Ahmed W, Fahal A, van de Sande W, Verbrugh H: Mycetoma caused by Madurellamycetomatis; *Lancet Infectious Diseases* (2004), 566–574. https://doi.org/10.1016/S1473-3099(04)01131-4
2. Maiti PK, Ray A, Bandyopadhyay S. Epidemiological aspects of mycetoma from a retrospective study of 264 cases in West Bengal. *Tropical Medicine & International Health*. 2002 Sep 1;7(9):788-92. https://doi.org/10.1046/j.1365-3156.2002.00915.x
3. van de Sande WW, Fahal AH, Goodfellow M, Welsh O, Zijlstra EE. Merits and pitfalls of currently used diagnostic tools in mycetoma. *PLoS Negl Trop Dis*. 2014 Jul 3;8(7):e2918. https://doi.org/10.1371/journal.pntd.0002918
4. Maina AM, Macharia JT. Alleviating a Nomad's Anguish: Successful Treatment of a Case of Leg Mycetoma—A Case Report. *Case reports in orthopedics*. 2012 Dec 3;2012.
5. Abd El Bagi ME. New radiographic classification of bone involvement in pedal mycetoma. *American Journal of Roentgenology*. 2003 Mar;180(3):665-8. https://doi.org/10.2214/ajr.180.3.1800665
6. Shamy ME, Fahal AH, Shakir MY, Homeida MM. New MRI grading system for the diagnosis and management of mycetoma. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 2012 Dec 1;106(12):738-42. https://doi.org/10.1016/j.trstmh.2012.08.009

Key Points:

- Madura foot is caused by fungus or actinomycosis infection.
- It's a chronic granulomatous infection, characterized by "tumour like" indurations in skin with sinuses discharging pus, blood and grains.
- Cases identified early could be effectively treated with antifungal or antimicrobials. If untreated at early stages it will present with debilitating massive tumour like lesions.
- Advanced cases of Madura foot in extremities may end up in surgical amputation.

SELECTED ABSTRACTS

Pathologic Outcomes of Laparoscopic vs Open Mesorectal Excision for Rectal Cancer; A Systematic Review and Meta-analysis

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Objective

To review and analyze the evidence concerning the pathologic outcomes of laparoscopic (LRR) vs open (ORR) rectal resection for rectal cancer.

Methods

The Cochrane Central Register of Controlled Trials, MEDLINE (through PubMed), EMBASE, Scopus databases, and clinicaltrials.gov were searched for randomized clinical trials (RCTs) comparing LRR vs ORR.

Study Selection Only RCTs published in English from January 1, 1995, to June 30, 2016, that compared LRR with ORR for histologically proven rectal cancer in adult patients and reported pathologic outcomes (eg, positive circumferential resection margin, and complete mesorectal excision) were eligible for inclusion. Of 369 records screened, 14 RCTs were selected for the qualitative and quantitative analyses

Data Extraction and Synthesis

Two independent reviewers performed the study selection and quality assessment. Random-effects models were used to summarize the risk ratio (RR) and mean differences.

Results

The meta-analysis included 14 unique RCTs with 4034 unique patients. Of 2989 patients undergoing rectal resection, a positive CRM was found in 135 (7.9%) of 1697 patients undergoing LRR and 79 (6.1%) of 1292 patients undergoing ORR (RR, 1.17; 95% CI, 0.89-1.53; P = .26; I2 = 0%) in 9 studies.

A noncomplete (nearly complete and incomplete) mesorectal excision was reported in 179 (13.2%) of 1354 patients undergoing LRR and 104 (10.4%) of 998 patients undergoing ORR (RR, 1.31; 95% CI, 1.05-1.64; P = .02; I2 = 0%) in 5 studies. The distal resection margin involvement (RR, 1.12; 95% CI, 0.34-3.67; P = .86), the mean number of lymph nodes retrieved (mean difference, 0.05; 95% CI, −0.77 to 0.86; P = .91), the mean distance to the distal margin (mean difference, 0.01 cm; 95% CI, −0.12 to 0.15 cm; P = .87), and the mean distance to radial margins (mean difference, −0.67 mm; 95% CI, −2.16 to 0.83 mm; P = .38) were not significantly different between LRR and ORR. The risk for bias was assessed as low in 10 studies, high in 3, and unknown in 1. The overall quality of the evidence emerging from the literature was rated as high.

Conclusions and Relevance Based on the available evidence, the risk for achieving a noncomplete mesorectal excision is significantly higher in patients undergoing LRR compared with ORR. These findings question the oncologic safety of laparoscopy for the treatment of rectal cancer. However, long-term results of the ongoing RCTs are awaited to assess whether these pathologic results have an effect on disease-free and overall patient survival.

Conclusions

The rate of positive circumferential resection margin (CRM), defined as 1 mm or less from the closest tumor to the cut edge of the tissue, and the quality of mesorectal excision (complete, nearly complete, or incomplete).

Commentary

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Safety of laparoscopy for rectal cancer surgery has remained controversial despite the gaining popularity of the technique. The two main outcome indicators; completeness of the mesorectum and circumferential margin clearance are regarded as the parameters of assessing safety of rectal cancer surgery. This meta analysis by Martínez-Pérez et al involving over 4000 patients reveals a significantly higher positive CRM and incomplete mesorectal excision in the laparoscopic group. In 2015 a randomized trial (ALaCaRT), produced similar results with T1-T3 tumours [1]. The inferiority of laparoscopic surgery could not be excluded from this trial.

An interesting observation in this study is the authors' classification of nearly complete and incomplete mesorectal excision in to a common non-complete group. The landmark study in this regard by Nagtegall et al in 2002 demonstrated that recurrence rates in the nearly complete cohort were equal to that of complete [2]. Trials having a longer follow up and clinical outcome as end points may answer these concerns.

Another confounding factor that affects a study of this nature is the surgical technique. Precise rectal dissection requires a considerable training and the surgeon factor would significantly affects the end points.

Although these results are unable to issue a verdict it should be considered in the decision making process. However these

findings should not discourage the use of laparoscopy but should rather encourage improvisations such as trans-anal dissection and robotic surgery.

References

1. Stevenson ARL, Solomon MJ, Lumley JW, Hewett P, Clouston AD, Gebski VJ, et al. Effect of Laparoscopic-Assisted Resection vs Open Resection on Pathological Outcomes in Rectal Cancer. JAMA [Internet]. 2015 Oct 6 [cited 2017 Mar 7];314(13):1356.
2. Nagtegaal ID, van de Velde CJH, van der Worp E, Kapiteijn E, Quirke P, van Krieken JHJM, et al. Macroscopic evaluation of rectal cancer resection specimen: clinical significance of the pathologist in quality control. J Clin Oncol [Internet]. American Society of Clinical Oncology; 2002 Apr 1 [cited 2017 Mar 7];20(7):1729–34.

How to select patients and timing for rectal indomethacin to prevent post-ERCP pancreatitis: a systematic review and meta-analysis.

Wan J, et al

BMC Gastroenterology 2017 Mar 15;17(1):43.

Objective

A systematic search was performed in June 2016. Human prospective, randomized, placebo-controlled trials that compared rectally administered indomethacin with a placebo for the prevention of post-ERCP pancreatitis (PEP) were included. A meta-analysis was performed using a random-effects model to assess the outcomes (PEP) using Review Manager 5.0.

Methods

Three hundred ninety-three grade II/III HD patients recruited in 22 centers from 2010 to 2013 were randomized to DGHAL (n = 197) or SH (n = 196). The primary endpoint was operative-related morbidity at 3 months (D.90) based on the Clavien-Dindo surgical complications grading. Total cost, cost-effectiveness, and clinical outcome were assessed at 1 year.

Results

Seven randomized controlled trials met the inclusion criteria (n = 3013). The overall incidence of PEP was significantly lower after prophylactic administration of rectal indomethacin than after administration of the placebo (RR, 0.58, 95% CI, 0.40–0.83; P = 0.004). A subgroup analysis was performed for rectal indomethacin administration compared to a placebo in high-risk patients (RR, 0.46; 95% CI, 0.32–0.65; P < 0.00001) and average-risk patients (RR, 0.75; 95% CI, 0.46–1.22; P = 0.25) and for administration before ERCP (RR, 0.56; 95% CI, 0.39–0.79; P = 0.001) and after the procedure (RR, 0.61; 95% CI, 0.26–1.44; P = 0.26).

Conclusions

This meta-analysis indicated that prophylactic rectal indomethacin is not suitable for all patients undergoing ERCP but it is safe and effective to prevent PEP in high-risk patients. In addition, rectal indomethacin administration before ERCP is superior to its administration after ERCP for the prevention of PEP.

Commentary

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Post-ERCP Pancreatitis (PEP) remains the most common complication of ERCP with an approximate average incidence of 3-5%. A number of patient related and procedure related factors have been identified as being associated with increased risk of PEP. Although much work has been done with regard to the prevention of this potentially life-threatening complication using a number of different techniques, only the use of prophylactic pancreatic duct stenting and prophylactic rectal NSAIDS appear to show any real promise.

This paper is a meta-analysis pooling data from 7 placebo controlled RCTs investigating the use of rectal indomethacin prevention of PEP, comprising of 3013 patients. The authors conclude that while rectal indomethacin is safe and effective in preventing PEP in high risk patients, it may not be useful in average or low risk patients.

There is now fairly convincing evidence that rectal NSAIDS, especially indomethacin is effective in reducing the incidence of PEP in high risk patient as borne out from evidence from a number of meta-analyses including this one. However its efficacy in lower risk patients is controversial.

Some other recent meta-analyses push the contrary view that there is effectiveness in an unselected patient population. Interestingly this paper has not included data from a large multi-centre RCT from China of over 2000 patients which suggests this view. Equally a large retrospective study of 4000 patients from Thiruvendam and colleagues in Pennsylvania also promotes this contention.

In Sri Lanka, there is no clear policy for rectal NSAID use for PEP prevention except in high-risk patients. At the present time, there is perhaps insufficient data to use rectal NSAIDS for PEP prophylaxis in all patients, but further results from on-going RCTs may help give a conclusive answer to this critical question.

Current treatment options for tendinopathy: a systematic review

Joel SVENSSON 1, 2, Praxitelis PRAXITELOUS 1, 2, Paul W. ACKERMANN 1

Published in Minerva OrtOpedica e trauMatOlOgica on March 2017

Background

Tendinopathy, both sports and work related, is increasing in prevalence. Evidence-based treatment options for tendinopathy, however, have been scarce. Here we provide a systematic review, updated on the current treat- ment options for tendinopathy.

Methods

References for this systematic review were searched in June 2016 without year restric- tions and limited to the English language in the following databases: Medline In-Process & Other Non-Indexed Citations (OVID), EMBASE (Elsevier), CINAHL (Ebsco), Cochrane Library including CENTRAL (Wiley), PEDro.

Results

Our search generated 2666 articles and where 97 where selected to be included in this review. Two reviewers independently evaluated the titles and abstracts of the identified publications and the selected full text manuscripts in an un-blinded standardized manner and excluded irrelevant articles (reviews, cadaver studies, technical descriptions, expert opinions). Disagreements between reviewers were resolved by consensus. We excluded articles stepwise based firstly on title, secondly on abstract, and thirdly on full text. Ninety of the selected articles were published in 2000 or later.

Conclusion

This evidence-based systematic review demonstrates that eccentric exercise and extracorporeal shock- wave treatment exhibit the best efficacy, cost effectiveness and fewer side effects and therefore should be the first-line of treatment for tendinopathy.

Commentary

Hiran Amarasekera
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Treatments of tendinopathies are common in orthopaedics and rheumatology

As there are many options sometimes it is difficult to judge what works and what doesn't. This systematic review looks at all options and their efficacies.

The authors have reviewed number of studies that describe number of treatment options that are used including eccentric and concentric exercises, manual therapy, NSAIDS, orthotic devices, bio physical treatments such as shock wave and low intensity ultra sound and Laser therapies, Pharmaco-therapies such as GTN, steroid injections and PRP (Platelet rich plasma) injections in number of different tendinopathies.

These include Shoulder, Elbow (Tennis elbow), Achilles patella tednoapthies, Dequervain's and many other conditions.

Authors conclude that non-invasive methods such as exercises and physio-therapy to be the first line effective treatment and injection such as PRP and steroids to be second line and to give temporary relief and limit surgery to resistant cases when above therapy fails. They also conclude that numbers needing surgery re relatively low.

Full text article is available as open access as "Svensson J, Praxitelous P, Ackermann PW. Current treatment options for tendinopathy: a systematic review. Minerva Ortop Traumatol 2017;68:20-33. DOI: 10.23736/S0394-3410.17.03785-7)"

http://www.minervamedica.it/en/getfreepdf/OIJQOKm%2FFmjNQqT9BohsqXzN3e51W29ij3TtcfpvN0Qj788oMGiSHfkY2x%2FM0jgSLeUVZw6GtVNAHuCRO4T95w==/R14Y2017N01A0020.pdf

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Trial of Pregabalin for Acute and Chronic Sciatica

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Background

Sciatica can be disabling, and evidence regarding medical treatments is limited. Pre- gabalin is effective in the treatment of some types of neuropathic pain. This study examined whether pregabalin may reduce the intensity of sciatica.

Methods

Wwe conducted a randomized, double-blind, placebo-controlled trial of pregabalin in patients with sciatica. Patients were randomly assigned to receive either pregabalin at a dose of 150 mg per day that was adjusted to a maximum dose of 600 mg per day or matching placebo for up to 8 weeks. The primary outcome was the leg-pain intensity score on a 10-point scale (with 0 indicating no pain and 10 the worst possible pain) at week 8; the leg-pain intensity score was also evaluated at week 52, a secondary time point for the primary

outcome. Secondary outcomes included the extent of disability, back-pain intensity, and quality-of-life measures at prespecified time points over the course of 1 year.

Result

A total of 209 patients underwent randomization, of whom 108 received pregabalin and 101 received placebo; after randomization, 2 patients in the pregabalin group were determined to be ineligible and were excluded from the analyses. At week 8, the mean unadjusted leg-pain intensity score was 3.7 in the pregabalin group and 3.1 in the placebo group (adjusted mean difference, 0.5; 95% confidence interval [CI], −0.2 to 1.2; P=0.19). At week 52, the mean unadjusted leg-pain intensity score was 3.4 in the pregabalin group and 3.0 in the placebo group (adjusted mean difference, 0.3; 95% CI, −0.5 to 1.0; P=0.46). No significant between-group differences were observed with respect to any secondary outcome at either week 8 or week 52. A total of 227 adverse events were reported in the pregabalin group and 124 in the placebo group. Dizziness was more common in the pregabalin group than in the placebo group.

Conclusion

Treatment with pregabalin did not significantly reduce the intensity of leg pain associated with sciatica and did not significantly improve other outcomes, as compared with placebo, over the course of 8 weeks. The incidence of adverse events was significantly higher in the pregabalin group than in the placebo group. (Funded by the National Health and Medical Research Council of Australia; PRECISE Australian and New Zealand Clinical Trials Registry number, ACTRN12613000530729.)

Commentary

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This is a very interesting and useful trial conducted on a drug, which is widely prescribed for sciatic pain. The patient group size and the double-blinded randomization, gives rise to a solid trial base.

Many specialists in the treatment of sciatica prescribe Pregabalin as a medication. Pregabalin as well as gabapentin is one of the first line treatments in the management of neuropathic pain related to sciatica.

This trial one of the first of its kind, puts into question its use especially taking into account the increase in side effects suffered by those who were prescribed it. This prompts close scrutiny of its use and further larger group trials. I will certainly be making changes in my practice.

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