Scholars Journal of Applied Medical Sciences (SJAMS)
Abbreviated Key Title: Sch. J. App. Med. Sci.
ISSN 2320-6691 (Online)
ISSN 2347-954X (Print)

A Unit of Scholars Academic and Scientific Society, India
www.saspublishers.com

Surgery

Complications Following Open Mesh Inguinal Hernia Repair

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Original Research Article

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Article History
Received: 26.11.2017
Accepted: 06.12.2017
Published: 30.12.2017

DOI:
10.36347/sjams.2017.v05i12.017

Abstract: Hernia repair is one of the first operations, which a surgeon will learn in his academic life. Open mesh repair for inguinal hernia is a safe method of operation. Newer laparoscopic mesh repairs are on the rise, but they need expertise. Complications which can be encountered post-surgery are pain, bleeding, urinary retention, scrotal swelling, abdominal distension, seroma and wound infections, chronic pain, keloid formation and testicular atrophy.
Keywords: Inguinal hernia, mesh repair, complications.

INTRODUCTION

Hernia is the bulging of the abdominal parts/contents of the abdominal cavity through a weakness in the abdominal wall. The exact causes of hernia have not been clearly defined. Various causes for hernia can be design weakness, structures entering and leaving abdominal cavity leading to weakness, developmental anomalies, genetic, trauma, pregnancy and ageing leading to weakness, neurological or muscle disease, increased intra-abdominal pressure because of chronic cough, benign enlargement of prostate, chronic constipation etc.

Inguinal hernia is the most common type of hernia. Inguinal hernias are rare in females [1]. Inguinal region consists of deep inguinal ring, inguinal canal and superficial inguinal ring, which make the region weak and susceptible to hernia.

Inguinal canal is bounded anteriorly by external oblique aponeurosis and laterally by fibres of conjoined muscle. Superiorly, it is bound by arched fibres of conjoined muscle. Inferiorly by inguinal ligament and lacunar ligament and posteriorly by fascia transversalis and conjoined tendon. 65% of inguinal hernias are indirect hernias and 35% direct hernias [2]. Hernia consists of three parts, sac, contents of sac (omentum, intestine, and Meckel's diverticulum) and coverings of hernia sac.

There are several types of operations done for inguinal hernia. Hernioplasty is indicated in inguinal hernia with weak abdominal muscle tone and in recurrent hernia cases where mesh plasty is preferred and in inguinal hernia with good muscle tone where darning can be done [3]. In mesh repair, posterior wall (Lichtenstein repair) of inguinal canal is strengthened by a Prolene or Marlex mesh. Over time, fibroblasts and capillaries grow over the mesh converting it into a thick sheath strengthening the posterior wall. Even though, the hernia repair is a common surgery, it is not without complications. Though rare, during surgery complications like injury to cord structures or injury to iliac vessels may arise. Post-surgery, early complications are pain, bleeding, seroma formation, infection, urinary retention, scrotal swelling and abdominal distension.

Seromas

Seromas commonly occur particularly in direct inguinal hernia repairs. The patient will usually present at the initial postoperative visit complaining of persistence of the hernia. On examination, a smooth slightly tender mass, which is non reducible and does not change with Valsalva will be identified in the inguinal canal. If obtained, an ultrasound will demonstrate the presence of the seroma and will reassure the surgeon as well as the patient. Unless, there are clear signs of infection, no other intervention needs to be or should be taken in regards to the presence of the seroma. They will resolve spontaneously if left alone [4].

Infections

Infections are early or late [2]. Early infections occur within the first couple of weeks following the hernia procedure and should be treated as skin and subcutaneous infections. Aggressive local wound care and antibiotics are advised. The initial approach should

be one with the idea of salvaging the mesh. CT scan imaging can be helpful to determine the depth of the infection. If the infection does not penetrate into the preperitoneal space, the wound can be opened for good drainage. With antibiotics, salvaging the mesh is usually successful. If, however, there is clear evidence of infection extending into the preperitoneal space, the most prudent course is to remove the mesh and handle the infection appropriately. It would be ill-advised to immediately place another synthetic mesh material into the wound. Late infections usually occur well past the initial operation. It generally means a mesh infection is present. Prolonged antibiotics can be attempted, but they generally are not effective and in most cases the mesh will need to be removed. Early removal of the mesh results in a more rapid resolution of the problem rather than prolonging the problem with unsuccessful therapy.

Recurrences

There are few recurrences in the published reports. Causes and mechanisms of recurrences have not been clearly defined. One of the primary concerns involves the extent of mesh shrinkage secondary to the ongoing inflammatory reaction through the polypropylene in the mesh. This shrinkage has been estimated in multiple published reports to range between 5% and 30%. As long as an adequate sized mesh is utilised and the mesh is deployed in the proper position, this should allow for the estimated shrinkage and prohibit recurrence from that point of view. In our experience of operating on our own recurrences as well as other recurrences, the most common cause was a missed indirect hernia. This probably resulted from the failure to completely skeletonise the cord structures at the time of the initial operation and recognise the presence of an indirect hernia. This resulted in a persistent indirect hernia rather than a recurrence.

Bleeding

Bleeding is not a common problem, as the dissection is generally performed in a bloodless plane. A preperitoneal repair should be avoided or approached with caution in the patients who require aggressive preoperative anticoagulation secondary to other underlying hypercoagulable or thromboembolic conditions (i.e., mechanical cardiac valves).

The preperitoneal space is very susceptible to ongoing haemorrhage secondary to the induced hypocoagulable situation. This ongoing haemorrhage can be extremely difficult to recognise in the preperitoneal space and significant haemorrhage can occur before it is picked up. It is therefore advisable that an anterior repair be carried out in these patients so that if bleeding does occur, it is obvious and can be addressed immediately.

Chronic groin pain

While the recurrence rate of inguinal hernia repairs is significantly reduced by use of mesh and tension-free techniques, post herniorrhaphy chronic pain remains the concern of hernia surgeons around the globe. Based on the classification of pain by the International Association for the Study of Pain (IASP), post herniorrhaphy inguinodynia can be broadly divided into nociceptive and neuropathic pain. There is no sharp line between the nociceptive and neuropathic pain and the gray zone is further complicated by social, genetic, patient and psychological factors. Nociceptive pain is caused by activation of nociceptors by nociceptive molecules due to tissue injury or inflammatory reaction and transmitted to the brain via A-delta and C-fibers. Nociceptive pain can be reduced by gentle tissue handling using local anaesthesia to reduce production of nociceptive molecules and avoiding forceful tissue retraction. Recommended timing for surgical treatment of chronic post herniorrhaphy pain not responding to nonsurgical treatment is 6 months to 1 year after the original hernia repair. It is important to ask and document if the patient had groin pain prior to the original hernia repair and whether the postoperative pain is different from the preoperative pain [2].

Miscellaneous complication

Injury to bowel, ileac vessel injury is rare complications of mesh repair.

MATERIALS AND METHODS

A total of 176 patients who were admitted and underwent open mesh repair were analysed for this study conducted from September 2014 to August 2016. The detailed history, clinical examination, laboratory investigations were done, which included routine haematological investigations, urine routine, chest x-ray. The patients were taken for open mesh hernia repair surgery. The patients were followed up for one year. All the complications that was encountered was noted and reported.

Inclusion Criteria

Inguinal hernia cases treated by open mesh repair.

Exclusion Criteria

Other types of inguinal hernia repair.

RESULTS

Table-1: Showing the Sex Distribution

Sex	Frequency
Male	176
Female	Zero

Table-2: Showing Age Group

Age Group	Frequency
0-20 years	10
21-40 years	112
41-60 years	45
>60 years	9

Table-3: Showing the Type of Inguinal Hernia

Type	Incidence
Indirect inguinal hernia	130
Direct inguinal hernia	46

Table-4: Showing intra operative complications

Complications	Incidence
Bleeding	3
Anaesthetic complications	1

Table-5: Showing post-operative complications

Complications	Frequency
Pain	19
Bleeding from site	1
Seroma	12
Wound infections	2
Scrotal swelling	11
Wound dehiscence	2
Keloid formation/ hypertrophic scars	3
Anaesthetic complications	2
Urinary retention	5
Abdominal distention	1
Testicular atrophy, bowel injury, ileac vessel injury	0

DISCUSSION

All the cases studied belonged to male sex (table 1). In our study, age group twenty to forty years amounted to one hundred and twelve cases followed by age group forty to sixty years, which amounted to forty five cases (table 2). Age group zero to twenty years amounted to ten cases and age group more than sixty years amounted to nine cases. In the study group, one hundred and thirty cases were indirect inguinal hernias and forty six cases were direct inguinal hernias (table 3). Based on the complications encountered, pain at the site was the commonest complaint, which amounted to nineteen cases, seroma was seen in twelve cases, in eleven cases scrotal swelling was seen, five cases developed urinary retention, three cases developed keloid/hypertrophic scars and two cases developed wound dehiscence, infection and anaesthetic related complications(table 5). Bleeding from site (table 4) and abdominal distention amounted to one case each.

None of the complications were serious and life threatening and were managed conservatively. This study was in agreement with the study conducted by Rashid Abd Elhalim Khalil, Awad Ali M Alawa [5]. Open mesh repair had less number of complications compared to laparoscopic repair as evidenced in study conducted by other researchers [6-8].

CONCLUSION

A sincere effort has been put in this study to understand the complications associated with open hernia repair of inguinal hernia. This study is intended to benefit the surgeons to understand and anticipate the common complications associated with the surgery. Newer laparoscopic mesh repairs are on the rise, but they need expertise.

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