RETROSPECTIVE DESCRIPTIVE STUDY OF ABDOMINAL WALL HERNIAS AND THEIR MANAGEMENT

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ABSTRACT**BACKGROUND**

This is a retrospective descriptive study of 422 cases of abdominal wall hernias done by single surgeon and their follow-up upto 12 years. Abdominal wall hernias are a group of conditions, which occur mainly through the natural openings and weak areas of abdominal wall- 1. Groin, 2. Ventral part of the anterior abdominal wall, 3. Previous operative sites and 4. Through natural openings and weak areas of abdominal wall.

MATERIALS AND METHODS

422 cases of abdominal wall hernias treated in the last 12 years along with their management were studied. They were followed upto 12 yrs. The differences in the selection of cases and surgical skill are excluded in the study by including cases done by single surgeon (1st Author) only. Only open surgeries are included in the study to avoid learning curve mistakes.

Mode of Presentation- Elective and emergency surgery and their management is discussed. Anatomical tissue repair, monofilament polypropylene mesh repair in primary and recurrent hernias of various varieties and their results were studied. Bowel resections, omental excisions and separation of bowel adhesions (Adhesiolysis) in sliding and irreducible hernias are analysed. Various complications including mortality are discussed.

RESULTS

No recurrences were observed in mesh hernioplasty patients. 6 cases of recurrences were observed in anatomical repair patients- 1.4%. Monofilament polypropylene mesh was used and fixed to the tissues with 2.0 prolene. 3 patients expired in our series in complicated and strangulated cases- 0.7%.

CONCLUSION

Prolene mesh repair is definitely superior to anatomical tissue repairs in all cases of abdominal wall hernias. Anatomical tissue repair in young good musculature and small defects gives equally good results in experienced hands.

KEY WORDS

Abdominal Wall Hernia, Inguinal, Umbilical, Incisional, Strangulation, Bowel Resection, Omentum, Mesh Repair.

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BACKGROUND

Hernia means "rupture" in Latin. It is defined as "Protrusion of a part or whole of the viscus through abnormal opening or a weak area of its containing cavity.^[1]" If it occurs in the groin- groin hernia; occurs in the anterior abdominal wall- ventral hernia; occurring from previous surgical incision site- incisional hernia.

Hernia is known to mankind since long time (1500 BC).^[2] Hernia is a non-lethal condition and can wait for many years - until either obstr

ucted or strangulated - when it becomes dangerous to life. Groin hernia is classified into inguinal and femoral basing on anatomy - in 14th Century.

Anatomical differences between indirect and direct hernias were reported in 1559 AD. It can be either congenital in neonates or in childhood (simple or life-threatening) or acquired in older age.

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No disease of the human body belonging to the province of the surgeon requires in its treatment a better combination of accurate anatomical knowledge and surgical skill than hernia in all its varieties- Sir Astley Paston Cooper (1804).^[1]

Management of hernia demands absolute anatomical details of that area and surgical skill to get best results. Surgical management of groin hernia was first performed in 1st century AD. Surgical principles of groin hernia management are evolved in 700 AD.

Standard anatomical repair of inguinal hernia is from Bassini in 1884 AD.^[3] He followed 250 patients of hernia repair patients for 5 years and presented in 1889 with 2% recurrence rate. Recently with increasing life-span, obesity and lifestyle changes, more number of complicated surgeries performed to a person are leading to more number of ventral hernias in addition to naturally occurring groin hernias.^[4] Hernioplasty is necessary for those hernia conditions either by open or by laparoscopic surgery. Detailed management of various types of hernias in our study of 422 cases are analysed and their results are given. The differences in the selection of cases and surgical skill are excluded in this study by including the cases done by single surgeon (1st Author) only. Open surgeries are only included in this study to avoid learning curve mistakes.

Aim of Study

To know the efficacy of anatomical tissue repair and mesh hernioplasty in abdominal wall hernias.

MATERIALS AND METHODS

It is a retrospective descriptive study. 422 cases of abdominal wall hernias & their management were studied in the last 12 years. They are followed upto 12 years. The differences in the selection of cases and surgical skill are excluded in the study by including the cases done by single surgeon (1st Author) only. Open surgeries are only included in this study to avoid learning curve mistakes.

No recurrences were observed in mesh hernioplasty patients. Six cases of recurrences observed in anatomical repair patients- (1.4%). Monofilament polypropylene mesh was used and fixed to the tissues with 2-0 prolene. Three patients expired in our series in complicated and strangulated cases- 0.7%.

Prolene mesh repair is definitely superior to anatomical tissue repairs in all cases of abdominal wall hernias. Anatomical tissue repair in young good musculature and small defects give equally good results in experienced hands.

Sl. No.	Age in Years	No. of Cases	Percentage
1	0-5	18	4.2%
2	6-10	6	1.4%
3	11-20	20	4.7%
4	21-40	114	27%
5	41-60	170	40.28%
6	61-80	76	18%
7	> 80	18	4.2%
	Total	422	100%
	SIDE		
8	Right	176	58.7%
9	Left	108	36.0%
10	Bilateral	16	5.3%

Table 1. Age and Side Wise Distribution

Sl. No.	Type	Total No.	%
1. Uncomplicated	Reducible	322	76.3
2. Complicated	Irreducible, Obstructed and Strangulated	100	23.7
	A. Sliding Hernia and (Left Colon Reduction)	12	2.8
	B. Adhesiolysis	25	5.9
	C. Hysterectomy	1	0.24
	D. Omental excision	48	11.4
	E. Bowel resections	14	3.3
	F. Strangulated	18	4.2

Table 2. Management Profile

Mode	No. of Cases	Percentage
Elective	346	82
Emergency	76	18

Table 3. Mode of Presentation to Hospital

Figure 1. Left Colon in Indirect Inguinal Hernia

Figure 2. Left Indirect Inguinal Hernia contains Uterus, Tubes and Ovaries in Male

RESULTS**Age**

Hernia is more common in 5th and 6th decades - 40% followed by 3rd and 4th decades - 27% (Table 1).

Side Wise

We have found right-sided inguinal hernias in 58.7% compared to left-sided 36% as seen in Table 1.

Inguinal- 71%

Inguinal hernias were observed in our series (300/422)- 71% of all abdominal wall hernias. Out of the inguinal hernias, males are 98% (294/300) and females are 2% (6/300). Femoral hernias- 1.4% was seen only in females (6/422) - 1.4% in our study as seen in Table 2.

Figure 3. Strangulated Femoral Hernia

Next Common Variety Incisional Hernia- 12.8%

Incisional hernias are more common in females 44/54 - 81.5%. Almost all of them are in lower midline incisions for hysterectomies and other pelvic surgeries. Males - (10/54) - 18.5% - (Table 2). They are upper midline, subcostal and appendicular incision hernias.

Umbilical - 8.5%

Umbilical hernias are more common after middle age, which constitute 8.5% of all hernias. They are mainly due to obesity in adult life. It is seen in 66.6% in males (24/36) - in contrast to the standard teaching of higher incidence in females (12/36) - 33.3%.

Epigastric Hernia - 6.2%

6.2% of all hernias are epigastric hernias in my series. Majority of them are male persons, 92%. Only (2/26) - 8% are females - 72% of hernia patients presented to the hospital as elective and 18% as emergency as seen in Table 3.

Criteria to Select for Mesh Repair - in our Cases are

1. Large sized inguinal hernias, mostly direct variety.
2. Obese people and smokers.
3. Aged.
4. Recurrent hernias.
5. Non-infected cases.
6. Incisional hernias.
7. Affordability and acceptance of the patient.

Criteria for Anatomical Repair

1. Young.
2. Good musculature and fascia.
3. Small defect in the fascia/ Linea alba.
4. Not willing to get mesh insertion.
5. Infected cases (Strangulated - Bowel Gangrenous).
6. Non-affordability.

Management

All people are operated by single surgeon (1st Author). Both elective and emergencies are operated under Spinal/ General anaesthesia. Uncomplicated hernias (Reducible hernias) are (322/422) - 76.3%. Simple herniotomy plus anatomical tissue herniorrhaphy and Lichtenstein mesh hernioplasty^[5] was done basing on the criteria followed by us. I always fix mesh with 2-0 prolene suture. Large sized, obese, smokers, aged, recurrent, non-infected and incisional hernias are operated with Lichtenstein mesh hernioplasty.

Complicated - 23.7%

Simple irreducible/ obstructed/ strangulated hernias constitute (100/422) - 23.7% of all hernias. Out of them - on exploration and release of minor adhesions 25 cases - 5.9% reduced (Fig. 1) without any problem. Whereas in 48 cases omentum is matted, sometimes haemorrhagic - which needed excisions - 11.4%. In large irreducible hernias in left inguinal region - sigmoid colon present in 12 cases - 2.8%. In strangulated hernias of incisional, inguinal, femoral and umbilical hernias - after careful release of all adhesions - the gangrenous small bowel and omentum were resected and end-to-end anastomosis was done in 14 cases - 3.3% as seen in Table 2. In 35 years, male left indirect inguinal hernia in

uterus and fallopian tubes are present - which were excised as shown in Figure 2.

Figure 4 (A and B). Matted Omentum in Indirect Inguinal Hernia. Excision of the Omentum

Figure 5. Releasing of Densely Adherent Bowel

Complications

1. We have operated maximum number of patients under spinal anaesthesia. General anaesthesia is given whenever necessary. Minor wound infections occurred in 14 cases, which resolved with antibiotics and dressings in 5 to 8 days (14/422) - 3.3%.
2. Stitch abscess occurred in 10 patients, where subcutaneous catgut is not absorbed which resolved after opening it (10/422) - 2.3%.
3. Seromas collected in the spermatic cord and scrotum in 6 cases, which resolved after 10 to 15 days of treatment with NSAID (6/422) - 1.4%.
4. Tunica vaginalis hydrocele occurred in 2 patients after 2 months (2/422) - 0.47%.
5. In a case of inguinal mesh repair - a piece of mesh projecting out of the wound due to infection. After excising the projecting pieces of the mesh around 0.5 cm each - the wound healed. There are no haematomas in our series.

Mortality

3 Patients expired in our series. A 60 years old patient with strangulated inguinal hernia which needed bowel resection - later developed anastomotic leak - expired. 2nd Patient 87 years old female with strangulated femoral hernia expired on 9th day due to respiratory complications. 120 kgs obese male with recurrent incisional hernia - strangulated - needed massive bowel resection of 10 feet (Fig. 6 (A and B)), developed anastomotic leak - developed faecal fistula - died after 3 months (3/422) - 0.7%.[6,7,8]

**Figure 6 (A, B). Recurrent Strangulated Incisional Hernia
Massive Bowel Excision in the same case Obese**

Recurrences

No recurrence was observed in mesh hernioplasty patients. Anatomical repair patients - 2 recurrences in less than 1 year - in inguinal hernia. They are obese and not willing for mesh repairs 10 years back. Umbilical - 2, epigastric hernia - 2 each 6/422 - 1.4%. We have enquired about the operated patients for the last 12 years and we did not get any recurrence information more than those patients.^[9]

DISCUSSION

Hernia is one of the commonest general surgical problems operated by junior and senior surgeons. It is quite simple to manage in early cases; hence we give chances in postgraduate training itself. Sometimes, it is highly complicated when it is sliding variety/ obstructed with adhesions/ large irreducible obstructed incisional hernias, and in strangulated cases where it needs bowel resection/ adherent and matted omentum - which needs excision.

There are many types of hernia repairs done by many surgeons all over the world since centuries. No procedure is absolutely free of recurrences or complications. Hence, diversity of procedures to treat are in practice. In my opinion, each case should be treated for the suited repair.

Age

Hernias are most common in middle part of life. 67% was observed in between 3-6 decades in our series. These are acquired variety with increased intra-abdominal pressure due to any cause- Obesity, COPD and defective collagen patients. It is comparable to the studies of earlier reports by Dr. Vivek Laxmanbhai Patel, Dr. Pooja Akash Pachani, et al^[10] and also Dr. S. Vijay Kumar^[11,12] et al in 2016.

In our series - 4.2% incidence is seen in the age group of 1 - 5 years - mostly due to congenital hernias. Overall, the incidence of inguinal hernia in children is 0.8 to 4.4% as reported by Mary I Brand et al.^[13] The incidence decreased between 6 - 20 years - 1.4%. In 7th and 8th decades - it is fairly common - 18%. After 80, it is less due to decreased survival. Complications and mortality is high in 8th and 9th decades and in emergency surgeries in our series, which is comparable to the other studies like Compagna et al 2013^[7] and Helgstrand et al.^[8]

Side

Right-sided inguinal hernias are more common due to late descent of testis into the scrotum in foetal life and also due to failure of obliteration of process vaginalis. It is comparable to the studies of Mary L Brand et al in 2008^[13] - surgical clinics of North America, which are quoted 60% on right side. Tanyel et al suggested that failure of regression of smooth muscle in processus vaginalis may have a role in the development of indirect inguinal hernia.^[14,15] We had 5.3% bilateral hernias

at presentation, unlike 23.8% in the study of Dr. S. Vijay Kumar^[11] et al 2016.

Region Wise/ Groin

Inguinal hernias are commonest of all abdominal wall hernias (71%) in our series. It is comparable to the study of Dr. C. Palanivelu et al in 2008 as 76%.^[16] Indirect hernias 73.3%, Direct hernias 17.3%, Pantaloon (28/300) - 9.3% are observed in our series.

In Western series femoral hernias are quoted upto 22.4% of female groin hernias and 1.8% of male groin hernias^[17] (Annals of surgery, 2007). But in our series femoral hernias are seen only in females, not seen in males. Femoral hernias are less common in our series when compared to western literature (< 2% versus 10% to 20%) in other series.^[17] Femoral and inguinal hernias are equal in number in females in contrast to western population. This might be due to changes in pelvic girdle differences between West and India. This is also corroborated by other Indian reports.^[11]

Incisional Hernia

High incidence may be due to more no. of complicated surgeries done to a person due to imperfect closure of the abdominal wall and post-operative infections of the incisions.^[8] Incisional hernias are increasing gradually. The same incidence is comparable to the other studies (15 to 20%).^[18]

Epigastric and Umbilical Hernia

Epigastric and umbilical hernias are less common in females in this semi-rural area - might be due to agricultural working nature of the women - thereby less obesity - less incidence of epigastric and umbilical hernias in females.

Management

In the past decades, acceptability and affordability of mesh repair is less in this region. Now with improved lifestyle and living standards - people are accepting mesh hernioplasties. We prefer monofilament polypropylene mesh, because it is biologically inert in almost every person (Rajvilas Narkhede - IJS)^[19] it is having less intertwined areas, thereby decreased bacterial adherence to this mesh when compared to multifilament mesh - which contains more surface area and intertwines. Monofilament meshes have decreased anti-adhesive coating to staphylococcus attachment.^[20,21,22,23] There are reports of mesh infection rate varying from 5% to 10%.^[24,25] Necrotising fasciitis like serious life-threatening infections are reported in the literature after mesh insertion.^[26] Smoking is associated with connective tissue disruption, thereby increasing the incidence of recurrence.^[27]

We have done mesh repair as per the earlier criteria only.

Figure 7. Prolene Mesh Repair in Incisional Hernia

We have done mesh hernioplasty in 35.07% of all cases, highest being incisional hernia 62.9% followed by epigastric 46.2%, umbilical 38.9% and inguinal 29.3%. In the last 2 years figure is increasing - 36/62 - 58%. It shows mesh hernioplasty rate is increased.

In spite of high rate of anatomical repair in all varieties of abdominal wall hernias, the recurrence rate is 1.4%. Even though some patients might have not responded to enquiry - it is not more than 2% to 3% - comparable to the results of Janu PG et al.^[28, 10] Hence, in suitable cases anatomical repair should be done. Mesh hernioplasty is definitely superior to other varieties of repair (very negligible recurrences).

This is also comparable to the reports of Dr. Vivek Laxmanbhai Patel et al, which reported 0% recurrence in Lichtenstein mesh hernioplasty and 2% in anatomical tissue repair.^[10]

CONCLUSION

Prolene mesh repair is definitely superior to anatomical tissue repairs in all cases of abdominal wall hernias. Specifically, so in obese, recurrent, weak abdominal wall musculature of old age and collagen tissue defect people. Anatomical tissue repair in young patients with good musculature, and small defects give equally good results in experienced hands. In Indian rural population, early small hernias and in young people, anatomical repair is suggested to avoid cost, foreign body placement and mesh infection. Hence, we recommend anatomical tissue repair in suitable cases. Anatomical repair has cured lakhs of patients worldwide for centuries in expert hands of surgeons.

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