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Original article

Use of surgical site compression to prevent Seroma formation following open inguinal Hernioplasty with use of Polypropylene Mesh

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ABSTRACT

Background: Seroma formation is a common complication of surgical procedures where anatomical dead space is created. Not only do seromas cause patient discomfort, they also require aspirations, or additional surgical procedures for resolution. In addition, seromas carry the risk of becoming infected, resulting in an abscess. Our purpose was to study the use of simple surgical site compression to prevent seroma formation following open inguinal hernioplasty with the use of polypropylene mesh. **Methods:** 64 male patients undergoing open inguinal hernia repair surgery in Ramakrishna mission Seva Pratishthan, Kolkata from June 2015 to December 2015 were divided into two groups. 32 patients in Group 1 received post operative surgical site compression with Gauze pieces and elastic adhesive tape (Dynaplast* Johnson & Johnson) which was opened on 7th post operative day. The 32 patients in group 2 did not receive the above explained compression. Patients were followed till 3 months and assessed for seroma formation. Ours is a retrospective non comparative study. **Results:** Only 2 of 32 (6.25%) patients in group 1 developed seroma while 9(28.13%) in group 2 developed seroma. Most of the seroma cases did not complicate with development of wound infection and were amenable to simple drainage. Only 3 in group 2 were infected while none in group 1 developed infection. This difference was found to be statistically significant (p value= 0.020). **Conclusion:** Simple post operative compression of surgical site following inguinal hernia repair with use of polypropylene mesh significantly reduces the incidence of seroma formation.

KEYWORDS: Seroma, inguinal hernia repair, polypropylene mesh, compression

INTRODUCTION

Seroma formation is a common complication of surgical procedures where anatomical dead space is created.[1] Not only do seromas often cause patient discomfort, [2] they also usually require multiple percutaneous aspirations, and possibly additional surgical procedures.[3] In addition, seromas carry the risk of becoming infected, resulting in an abscess.

Seroma etiology remains unknown, but it seems to be due to a local inflammatory response to a mechanical injury incurred by tissue aggression during surgery and the presence of foreign bodies [4]. The use of drainages does not decrease the frequency of seroma formation [5], and a direct relationship exists between the amount of mesh in contact with subcutaneous tissue and the incidence of seroma [6].

It has been suggested that seroma develop as a result of the infammatory response to the presence of polypropylene mesh [7]. Horstmann demonstrated that seroma rates vary in proportion to the amount of polypropylene contained in the mesh [pure polypropylene (12.1%) vs polypropylene/ polyglactin (4.1%)] [8].

Percutaneous or surgical drainage is required when a seroma becomes symptomatic, and this procedure is associated with a risk of infection. When a seroma persists despite successive drainages, it becomes a difficult-to-solve problem and an important impairment to the patient's quality of life. During open tension free Inguinal Hernia repairs, Mesh placement is most commonly beneath the external oblique aponeurosis layer, thus preventing direct contact with the subcutaneous tissue. Neverthless, seromas

do occur following the procedure and are directly related to tissue handling techniques during the surgery.

Numerous studies have been performed to evaluate the effectiveness of various strategies to reduce the incidence of postoperative seromas. A number of prospective, randomized, controlled trials have been performed. Those trials have evaluated the effects of factors such as dissection method, postoperative immobilization, postoperative compression, negative pressure drains, fibrin glue, talc, quilting sutures, and others on the incidence of seroma formation[9]. Our purpose was to study the use of simple surgical site compression to prevent seroma formation following open inguinal hernioplasty with the use of polypropylene mesh. Ours is a retrospective non comparative study.

OBJECTIVE

To compare seroma formation following open inguinal polypropylene mesh hernioplasty in those receiving post operative surgical site compression with control.

MATERIALS AND METHODS

Subjects: 64 male patients undergoing open inguinal hernioplasty surgery in Ramakrishna mission Seva Pratishthan, Kolkata from June 2015 to December 2015 for inguinal hernia were included in the study.

These patients by computer generated randomization were randomized into 2 groups:

Group 1- 32 patients who received post operative surgical site compression

Group 2- 32 patients who did not receive surgical site compression post operatively or the control group

Inclusion criteria: Male patients between the ages of 18 to 60 years with groin hernia. (Direct/ Indirect inguinal hernia)

Exclusion criteria: Obstructed/ strangulated hernia.

Operative methodology: Tension free hernioplasty was carried out using light weight prosthetic polypropylene (3 × 5 inch) mesh, without distortion of the anatomy and, most importantly, without any tension along the suture line. Regarding peri-operative care, 30 minutes before the incision, a bolus dose of a second-generation cephalosporin is given intravenously & prophylactic intravenous administration of antibiotics for 24 hours postoperatively, followed by oral antibiotics for 7 days. Post operative anti-inflammatory agent for pain relief given was diclofenac 1mg/kg thrice daily dose for 5 days.

No Drains were used: Compression over the operated groin region with layers of gauze pieces and elastic adhesive tape (dynaplast*Johnson&Johnson) applied, and left in place till 7th post operative day.

Follow up: Patient was followed up post operatively 1 week after discharge, after 1 month and over phone for next 2 months. During these visits patient was clinically examined for presence of seroma, wound infection with dehiscence with or without late mesh rejection, recurrence

RESULTS

We observed that only 2 of 32 (6.25%) patients in group 1 developed seroma while 9 (28.13%) in group 2 developed seroma (p =0.020).This difference was found to be statistically significant. (table1). Thus use of routine compression of surgical site for 7-10 days significantly reduced formation of seroma.

Most of the seroma cases did not complicate with development of wound infection and were amenable to simple drainage. None in group 1, while only 3 of 32(9.38%) in group 2 were infected (p=0.076). This difference was found to be non significant (table2).The three cases of infection were superficial and none got complicated with late mesh rejection. There were no cases of recurrences amongst the two groups.

Table 1: Incidence of seroma formation

		Group		Total		
		GROUP 1	GROUP 2		p Value	Significance
Seroma formation	No	30(93.75)	23(71.88)	53(82.81)	0.020	Significant
	Yes	2(6.25)	9(28.13)	11(17.19)		
Total		32(100)	32(100)	64(100)		

Table 2: Incidence of wound infection, associated late mesh rejection and recurrence

		Group		Total		
		GROUP 1	GROUP 2		p Value	Significance
Surgical site infection	No	32(100)	29(90.63)	61(95.31)	0.076	Not Significant
	Yes	0(0)	3(9.38)	3(4.69)		
Total		32(100)	32(100)	64(100)		
		Group		Total		
		GROUP 1	GROUP 2		p Value	Significance
Late Mesh	No	32(100)	32(100)	64(100)	NA	NA

rejection	Yes	0(0)	0(0)	0(0)		
Total		32(100)	32(100)	64(100)		
		Group		Total		
		GROUP 1	GROUP 2		p Value	Significance
Recurrence	No	32(100)	32(100)	64(100)	NA	NA
	Yes	0(0)	0(0)	0(0)		
Total		32(100)	32(100)	64(100)		

DISCUSSION

Of the various methods studied to prevent seroma formation, our study addresses only compression, which alone was found to be significantly effective. Only 2 of 32 patients in group 1 developed seroma while 9 in group 2 developed seroma. There are not many studies performed previously to compare seroma formation with or without compression following open inguinal hernia repair. Although, similar study by VM Reddy et al [9] for Laparoscopic hernia repair showed similar outcome with decreased seroma formation associated with routine surgical site compression.

The technique of simple compression did not have any significant affect on occurrence of wound infection and associated late mesh rejection or recurrences. Lau demonstrated that a large hernia defect is a risk factor for seroma formation, which implies that dead space left following inguinal hernia repair plays an important role in seroma development [**7**]. The technique we have described reduces the potential space in which seroma can form and therefore reduces seroma development.

The scope of further studies with better standardization of type of inguinal hernia, method of dissection with or without use of energy source persists.

CONCLUSION

Post operative compression of surgical site following inguinal hernia repair with use of polypropylene mesh significantly reduces the incidence of seroma formation.

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