

A Comparative Analysis on Various Techniques of Incisional Hernia Repair—Experience from a Tertiary Care Teaching Hospital in South India

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Abstract This prospective study was conducted at a tertiary care teaching hospital in South India over a period of 7 years and included 90 patients with incisional hernia ($n=90$; 76 females and 14 males), operated over 2 years (January 2004 to December 2005), and followed-up for 5 years postoperatively (2005–2009). As per the surgical unit preference, patients underwent different methods of hernia repair—onlay mesh repair ($n=45$, 50 %), underlay mesh repair ($n=18$, 20 %), and anatomical repair (i.e., without mesh) ($n=27$, 30 %). Parameters studied included seroma formation, wound infection, postoperative pain, and hernia recurrence. Although the first two parameters were statistically not significant, postoperative pain was found to be more in patients who underwent an underlay repair. A significant difference in the hernia recurrence rate was observed between mesh repair and anatomical repair groups. Hence, we conclude that all incisional hernias should be repaired with a mesh (meshplasty).

Keywords Incisional hernia · Mesh repair · Recurrence

Introduction

Incisional hernia is a perfect example of the old aphorism “an ounce of prevention is worth a pound of cure.” With the increase in the number of abdominal operations, the number of incisional hernias has also increased considerably. It is a common complication of abdominal surgery, reported in up

to 11 % of patients [1, 2] and in up to 23 % of those who develop postoperative wound infection [3]. Recurrence, the ultimate nightmare of a hernia surgeon, adds significantly to health care costs and poses a further economic burden. Various methods of repair of incisional hernia have been described, but each technique has its drawbacks. This prospective study was conducted to compare “sublay” meshplasty (mesh placement directly over the bowel), “onlay” meshplasty (preperitoneal mesh placement), and with no mesh (anatomical repair). Observations looked into were seroma formation, wound infection, postoperative pain, and hernia recurrence.

The Study

This is a prospective study was conducted over a period of 7 years that included 90 patients operated for incisional hernia in 2 years (January 2004 to December 2005) and followed up for 5 years postoperatively (2005–2009). These patients underwent different techniques of hernia repair depending on the surgical unit preference irrespective of the size of the hernia. The parameters studied were seroma formation, wound infection, postoperative pain, and hernia recurrence. Data analyzed were compared with available international data and conclusions were drawn accordingly.

Analysis

The average age of presentation in this study was 49 years. Incisional hernia occurred more commonly in women ($n=76$, 84.44 %) when compared to males ($n=14$, 15.55 %) and most commonly occurred after obstetric or gynecological procedures such as lower section cesarean section (LSCS), hysterectomy, or tubectomy. The size of the defect was

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Table 1 Postoperative complications in various types of repair in this study in comparison with other studies

Postoperative complications	Present study (anatomical repair)	Kuzbari et al. [1] (anatomical repair)	Present study (onlay)	Machairas et al. [2] (onlay)	Hameed et al. [7] (underlay)	Present study (underlay)
Seroma	3 (11.11 %)	1 (10 %)	11 (24.44 %)	6 (14 %)	1 (2 %)	5 (27.77 %)
Wound infection	1 (3.7 %)	1 (10 %)	6 (13.33 %)	3 (7 %)	2 (4 %)	2 (11.11 %)
Others	—	—	2 (4.44 %)	—	—	2 (11.11 %)

assessed clinically and was found to be between 3 and 12 cm. The most commonly performed procedure was mesh repair ($n=63$ patients) followed by the anatomical repair in 27 patients. Those who underwent anatomical repair had a defect less than 5 cm. The most commonly performed mesh repair was the onlay method ($n=45$) followed by the underlay repair ($n=18$).

The incidence of seroma formation in our study was more in patients with underlay repair (27.7 %, 95 % (confidence interval) CI = 7.03–48.37 %) compared to those without mesh (11.11 %, 95 % CI = -0.74 % to 22.96 %) and onlay repair (24.44 %, 95 % CI = 11.88–37 %), and the incidence of wound infection was more in onlay (13.33 %, 95 % CI = 3.4–23.26 %) compared to underlay repair (11.11 %, 95 % CI = -3.41 % to 25.63 %) (Table 1). Wound infections were negligible in patients who underwent repair without mesh (3.7 %). Postoperative pain (Table 2) was calculated by using the visual analog scale (VAS) of 1–10, and those with a pain scale of

Table 2 Postoperative pain in this study in various types of repair

Postoperative pain (VAS) ^a	Anatomical repair ($n=27$)	Onlay ($n=45$)	Underlay ($n=18$)
<5	23 (85.1)	30 (66.66)	7 (38.88)
>5	4 (14.81)	15 (33.33)	11 (61.11)

^a Visual analogue scale

more than 5 were considered significant. The patients who underwent underlay repair experienced more pain as compared to the patients who had an onlay mesh or anatomical repair. They were then followed up for a variable period of 2–24 months. Out of 90 patients included in the study, 21 patients were lost to follow-up. The remaining 69 patients who were followed up were included in the calculation of recurrence rate.

Table 3 Recurrence rate in this study in comparison with other studies

	Total patients	Followed-up patients	Present study (recurrences)	San Pio et al. [3]	Martin-Duce et al. [4]	Paajanen and Hermunen [5]	Luijendijk et al. [6]	Hameed et al. [7] (underlay)
Onlay	45	37	4 (10.8 %)	15 %				
Underlay	18	11	1 (9 %)		1 %	5 %		0 %
Anatomical repair	27	21	6 (28.57 %)				40–60 %	

Out of 69 patients who were followed up, 21 belonged to the anatomical repair group, 37 to the onlay group, and 11 to the underlay group (Table 3). The recurrence rate was highest in the anatomical repair group (28.57 %, 95 % CI = 9.25–47.89 %) followed by the onlay group (10.8 %, 95 % CI = 0.8–20.8 %) and the underlay group (9 %, 95 % CI = -7.9 % to 26.08 %). There was no statistical significance between onlay and underlay groups. However, a statistical significance between “with” mesh and “without” mesh groups was seen.

Comments

Sex distribution in this study showed a female preponderance. This is because there is frequent use of lower midline incision in women. Lower midline incisions are weak because they lack posterior rectus sheath and as the age advances the muscles also become weak and lax. Also, in pregnancy, overstretching of muscles and aponeurosis occur. The postoperative pain was more in patients who underwent underlay repair compared to onlay ($P<0.005$) or primary repair ($P<0.001$). This can be explained by the fact that more dissection is involved in an underlay repair. The recurrence rate was more in patients “without” mesh repair than in patients “with” mesh repair, which was statistically significant ($P<0.05$). However, there is no statistical significance between onlay and underlay repair ($P<0.5$). This is because of less number of patients in each group and various groups are not comparable. The overall recurrence rate was still around 12 % (95 % CI = 5.29–18.71 %) and is comparable to that available in literature [3]. In fact as per literature, the best position for inserting the material has not been conclusively established. However, a few studies claim that underlay repair (i.e., preperitoneal placement of mesh) is better and has a lower recurrence than its counterpart, the onlay repair [2].

Conflicts of interest Nil

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References

1. Kuzbari R, Worsg AP, Tairyh G, Deutinger M, Kuderna C, Metz V et al (1998) Sliding door technique for the repair of midline incisional hernias. *Plast Reconstr Surg* 101:1235–1242
2. Machairas A, Misiakos EP, Liakakos T, Karatzas G (2004) Incisional hernioplasty with extraperitoneal onlay polyester mesh. *Am Surg* 70(8):726–729
3. San Pio JR, Damsgaard TE, Momsen D, Villadsen I, Larsen J (2003) Repair of giant incisional hernias with polypropylene mesh: a retrospective study. *Scand J Plast Reconstr Surg Hand Surg* 37:102–106
4. Martin-Duce A, Nogueras F, Villeta R, Hernandez P, Lazono O, Keller J et al (2001) Modifications to Rives technique for midline incisional hernia repair. *Hernia* 5:70–72
5. Paajanen H, Hermunen H (2004) Long term pain and recurrence after repair of incisional hernias by open mesh: a clinical and MRI study. *Langenbecks Arch Surg* 389:366–370
6. Luijendijk RW, Hop WC, Van Den Tol MP, De Lange DC, Braaksma MM, Ijermans JN et al (2000) A comparison of suture repair with mesh repair of incisional hernia. *N Engl J Med* 343:392–398
7. Hameed F, Ahmed B, Ahmed A, Dab RH, Dilawaiz M (2009) Incisional hernia repair by preperitoneal (Sublay) mesh implantation. *APMC* 3:27–31