

Trans-fascial closure in laparoscopic ventral hernia repair

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Abstract

Background Laparoscopic incisional hernia repair has become widely accepted in the management of incisional hernias. There has been recent interest in combining fascial closure along with mesh placement to improve outcomes. We report our experience with this technique.

Methods Cases were evaluated retrospectively from 2012 to 2015. There were no exclusions. Cases were included which involved laparoscopic ventral hernia repair with fascial closure and mesh placement. Fascial closure was performed using non-absorbable sutures passed with a suture passage device percutaneously. A 5-cm overlap was performed using intra-peritoneal mesh. Fixation was performed using absorbable tacks in a double crown technique.

Results One hundred and twelve cases were included. The mean age was 57 years old (range 33–81 years). Fifty-nine were females and 53 were males. The median post-operative stay for the non-fascial closure group was 0 days (range 0–12 days). The median post-operative stay for the fascial closure group was 0 days (range 0–12 days). All cases were followed up clinically at 6 weeks. In the non-fascial closure group, five patients developed a seroma (12 %). One patient developed a wound infection (3 %). Six patients presented with a recurrence over the study period (15 %). In the fascial closure group, four patients had a seroma, which was managed conservatively (5 %). One patient developed a wound infection (1 %). Five

patients developed a recurrence over the study period (7 %).

Conclusion We have shown comparable rates for seroma and recurrence to other series. Laparoscopic incisional hernia repair with defect closure is feasible and reduces seroma rate and recurrence.

Keywords Ventral hernia · Defect closure · Laparoscopic ventral hernia repair · Laparoscopic incisional hernia repair

Background

Laparoscopic incisional hernia repair has become widely accepted in the management of incisional hernias. The traditional approach involves an intra-peritoneal bridging mesh to cover the hernia defect. There has been recent interest in combining fascial closure along with mesh placement to improve outcomes. We report our experience with this technique.

Methods

Cases were evaluated retrospectively from 2012 to 2015. There were no exclusions. Cases were included which involved laparoscopic ventral hernia repair with or without fascial closure and mesh placement. There was a single surgeon involved with expertise in laparoscopic hernia repair. Cases were not randomised, and the method of hernia repair was to the surgeon's preference.

All cases were performed with a three-port access from the lateral abdominal wall, using a 12-mm central optical port and two 5-mm instrument ports. Fascial closure was performed using non-absorbable sutures (0 polypropylene)

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passed with a suture passage device (Endoclose[™]) percutaneously. Small incisions were made on the skin overlying the hernia defect in intervals to allow a distance of 1 cm between each suture. Each suture incorporated a portion of rectus sheath and rectus muscle on either side. The sutures were tied extra-corporeally without pneumoperitoneum to allow an anatomical approximation of the defect. The mesh used was a composite mesh manufactured for intra-peritoneal placement (Physiomesh[™]). The mesh size was selected based on the size of the defect following defect closure. Fixation was performed using absorbable tacks (Securestrap[™]) in a double crown technique.

In cases without fascial closure, a three-port access technique was used for a laparoscopic repair. A conventional intra-peritoneal bridging mesh was placed (Physiomesh[™]). In all cases, a 5-cm overlap was performed and the mesh was secured using absorbable tacks (Securestrap[™]) in a double crown technique.

Follow-up was in the outpatient department at 6 weeks post-operatively. Patients were evaluated for post-operative complications, recurrence and chronic pain (which were defined as ongoing pain during the clinical consultation).

Results

One hundred and twelve cases were included. The mean age was 57 years old (range 33–81 years). Fifty-nine were female and 53 were male. Table 1.

There were 38 patients in the non-fascial closure group; the mean defect size was 9 cm in the transverse plane (range 2–18 cm). Nine patients in this group had defects larger than 12 cm. The median number of defects was 1 (range 1–3). There were no contaminated cases included in either group.

There were 74 patients in the fascial closure group; the mean defect size was 8 cm in the transverse plane (range 2–12 cm). The median number of defects was 1 (range 1–3).

There were no conversions to open surgery in either group.

The median post-operative stay for the non-fascial closure group was 0 days (range 0–10 days). The median post-operative stay for the fascial closure group was 0 days (range 0–12 days). Table 2.

All cases were followed up clinically at 6 weeks. In the non-fascial closure group, five patients developed a seroma (12 %). One patient developed a wound infection (3 %). Six patients presented with a recurrence over the study period (15 %).

In the fascial closure group, four patients had a seroma, which was managed conservatively (5 %). One patient developed a wound infection (1 %). Five patients developed a recurrence over the study period (7 %). One patient presented with chronic pain.

Discussion

Primary fascial closure during incisional hernia has recently been adopted by a number of centres. A recent systematic review has suggested that there is a reduced formation of seroma and recurrence rate with primary closure [1]. Although patients were not randomised in our study, we have shown a reduced rate of seroma and recurrence using fascial closure. We have not shown variation in chronic pain in this study. However, anecdotally we feel that patients do experience more acute pain in the early post-operative period with fascial closure. However, this seems to subside by 6 weeks based on our series.

The initial description of laparoscopic incisional hernia repair involves an intra-peritoneal mesh placement over the hernia defect [2]. This remains the standard in many centres. However, a bridging intra-peritoneal mesh in a conventional laparoscopic incisional hernia repair often leaves a large area of weakness in larger incisional hernias. This is certainly a major factor in “bulging” which may be seen on follow-up after several months [3]. This can lead to the possibility of pseudo-recurrence in the sense that the mesh itself may herniate into the defect [4]. This may then complicate any future procedures whether laparoscopic or open.

Table 1 Demographics

	Non-fascial closure (<i>n</i> = 38)	Fascial closure (<i>n</i> = 74)
Mean age (years)	58	55
Male	19	34
Female	19	40
Mean defect size (cm)	9	8
Mean mesh size (cm)	20	15

Table 2 Study outcomes

	Non-fascial closure (<i>n</i> = 38)	Fascial closure (<i>n</i> = 74)
Median post-operative stay	0	0
Seroma at 6 weeks	5	4
Wound infection	1	1
Recurrence	6	5
Chronic pain	1	1

Midline closure during incisional hernia repair is desirable in the sense that it reforms the abdominal cavity. It could be postulated that there is reduced pressure on the hernia repair by distributing abdominal pressure in a more uniform direction. There is also a benefit from the sense that the hernia is repaired from both a primary sutured technique and with intra-peritoneal mesh. Some authors advocate that this allows a greater mesh overlap at the time of repair with resulting reduction in recurrence rates [5, 6]. However, there are some unknown factors in this technique. This principally relates to the pneumoperitoneum during laparoscopic surgery. In our technique, we reduce pneumoperitoneum during defect closure. This allows full approximation during tying of the sutures. Some surgeons do not reduce pneumoperitoneum, which leaves the possibility of sutures loosening when pneumoperitoneum is reduced at the end of the procedure.

Seroma reduction is certainly an appealing benefit using a fascial closure technique. A number of studies have shown a reduced seroma rate with trans-fascial closure [7, 8]. It is certainly the case that seroma formation is multifactorial, but we feel that defect closure may reduce seroma formation by reducing dead space. Midline closure and avoidance of subcutaneous dissection (as in open surgery) may be important.

In assessing the success of abdominal wall hernia surgery, it is being recognised that patients' assessment of success may not entirely match our perceptions of success as surgeons. While common definitions of outcome assess objective outcomes (seroma rate, recurrence etc.), these may not be the same measures by which patients define a success. Increasingly, patient quality of life and return to normal activity are being seen as crucial factors in post-operative outcomes [9, 10]. A recent study by Ross et al. [11] has shown that surgery for large ventral hernias (>15 cm) results in reduced outcome and patient quality of life compared to surgery on smaller sized hernias.

In our experience, we feel that percutaneous trans-fascial sutures are superior to intra-corporeal sutures. A larger area of fascia may be taken in each suture. Knots may also be tied with balanced tension in an anatomical position with loss of pneumoperitoneum. This is not possible in

intra-corporeal techniques with the concurrent disadvantages already described.

Conclusion

We have shown comparable rates for seroma and recurrence to other series. Laparoscopic incisional hernia repair with defect closure is feasible and reduces seroma rate and recurrence.

Compliance with ethical standards

Disclosures Mr. Duncan Light and Mr. Sadiq Bawa have no financial disclosures to declare.

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