



MANAGEMENT OF INCISIONAL HERNIA: A REVIEW

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ABSTRACT Incisional hernia is a frequent adverse effect of abdominal wall incision performed globally, however there is still a lack of high-quality data to support proper management. Surgical method is a major risk factor for the emergence of an incisional hernia. Due to poor care, many incisional hernias in the past had high failure rates. There hasn't been much dissemination of evidence-based recommendations that can be used to repair abdominal wall abnormalities. Current advancements in incisional hernia surgery treatment will be covered in this review. These advancements could help surgeons choose the best technique and have an impact on the clinical results and quality of life of patients having incisional hernia repair in the anterior abdominal wall.

KEYWORDS : Incisional Hernia, Abdomen, Laparoscopy, Mesh, Hernia Repair

INTRODUCTION

Introduction and Background

Incisional hernias occur worldwide. It is unknown what percentage of incisional hernias occurs worldwide. The wide diversity of abdominal approaches, patient co-morbidities, and surgical procedures for abdominal wall closure are most likely responsible for the wide variation in incidence rates, which notably vary amongst the various patient populations. Incisional hernia (IH) is still a frequent, extremely morbid, and expensive consequence for surgical incision. Any abdominal wall gap with or without bulging in a postoperative scar that may be felt or seen through clinical examination or imaging is known as an incisional hernia [1]. It is likely that the wide diversity of abdominal approaches and surgical procedures for abdominal wall closure [2, 3, 4] contribute to a wide range of incidence rates that greatly vary amongst the different patient populations. The surgical method utilized to close the abdominal wall can have a considerable impact on the incidence of incisional hernia [5, 3].

Incisional hernia frequently occurs as a result of tissue rupture in the proximity of the abdominal wall incision closure and tissue strain caused by suturing. Incisional hernias are usually seen on the lower midline region [6]. A protrusion at the location of the incision and a positive cough impulse are the normal appearances. Patients with incisional hernias also run the risk of being incarcerated, obstructed, or strangled. Females are more likely to develop an incisional hernia twice as frequently as men [7] following gynecological and obstetric surgery like total abdominal hysterectomy, cesarean section, or tubal ligation. Incisional hernias make up 15% to 20% of all abdominal wall hernias. If an incisional hernia is not surgically repaired, the worst outcome is incarceration [8].

Patients who have an incisional hernia frequently report pain and a slowly expanding hernia, which indicates overstretching of the tissues. An incisional hernia is a sign of weakening of the sutured abdominal wall brought on by mechanical strain, poor wound healing, and/or inadequate scar formation. Non-midline incisions and laparoscopic surgery are recommended as safe and practical options. Suturing the fascial defect of 10 mm and bigger trocar sites is indicated in laparoscopic surgery, especially after single-incision laparoscopic surgery and at the umbilicus. A continuous small-bite suturing method with a progressively absorbable suture is recommended for the closure of an elective midline laparotomy. Inappropriate mesh selection, mesh size, and fixation in relation to hernia size are the primary causes of incisional hernia recurrence. Additionally, abdominal wall elasticity rarely assessed before surgery plays a significant influence. An independent variable for the likelihood of postoperative problems and recurrences is the magnitude of the abdominal wall defect.

**Review of Management of Incision Hernia
Factors Influencing Incisional Hernia Complications and Recurrence**

Repair of parastomal hernias, recurring hernias, and hernias with big and numerous defects are associated with increased risk of complications. Bowel anastomoses are substantially more risky for hernias since they take longer to operate on and have a built-in predisposing factor from handling bowels. Type of repair, obesity, the size of the hernia, diabetes, emergency surgery, postoperative wound dehiscence, smoking, steroid use, problems with wound healing, susceptible to postoperative wound infection [9] which are accompanied with several chronic co-morbidities are risk factors for the development of an incisional hernia [10, 11] and have impact on hernia recurrence.

Management of Incisional Hernias

Frequent methods of incisional hernia repair, either with or without mesh implantation. In prospective trials with sufficient follow-up, occurrences of incisional hernia after laparotomy have been recorded at up to 20%. After laparoscopy, 0.2% to 2% of all patients are at risk. In current surgical practice, laparoscopic method is more preferred than open method. When getting informed consent, the patient should be informed of the complications of the procedure, which include seroma formation, wound infection, damage to intra-abdominal tissues, and recurrence [12]. In a comparative, retrospective analysis of more than 400 incisional hernia procedures performed over a 25-year period, Langer and colleagues determined that the surgeon's experience is the most important prognostic factor [13].

When performing surgery, try to use small incisions to reduce the danger of developing hernias. If minor incisions are necessary, it may be preferable to position them away from weak areas. In addition to skin sutures, a deep muscle-fascia suture should be used to close an incision that is greater than 1 cm. The muscle should be sutured using tiny, closely spaced stitches and a progressively absorbable suture if there is a wide incision in the centre of the abdomen.

Use of Prophylactic Mesh

Laparoscopic or open surgery can be used to repair incisional hernias, and both techniques involve the use of a synthetic mesh [14]. To lower the likelihood of incisional hernia after elective midline laparotomy, prophylactic mesh augmentation is considered to reinforce the muscle layer. Mesh repair was thought to be preferable to anatomical repair alone due to the lower post-operative problems. The size of the mesh used has a direct relationship to the risk of complications connected to it [15, 16]. The development of biocompatible meshes with nearly physiological functional properties that produce the least possible foreign body reaction and be of the minimum necessary tensile strength is beneficial because large areas of prosthetic mesh are used to repair large incisional hernias [17]. Designing prosthetic mesh materials that are more physiologically suitable than those now utilized will be possible with knowledge of the maximal tensile strength and the dynamics of distension [18]. Abdominal wall

compliance before surgery and after the implantation of prosthetic mesh is facilitated by the application of three-dimensional stereography to quantify abdominal wall mobility and function [19]. The results of suture repair are expected to be twice as poor as those of mesh repair, and the methods now employed by surgeons to repair incisional hernias with prosthetic mesh are expected to have more than 20% recurrence rates [20]. To supplement the attenuated layers of the anterior abdominal wall, most surgeons advise adding synthetic mesh in an onlay position [21].

Both the onlay method and the inlay method place prosthetic mesh in contact with the underlying viscera without approaching the fascial borders used in the management of incisional hernias. Onlay or retromuscular placement of a permanent synthetic mesh is indicated in the management of incisional hernia. The onlay procedure involves covering the abdominal wall closure with mesh and inserting it in the subcutaneous prefascial region [22]. Skin flaps must be made in order to perform onlay repair, which may raise the danger of mesh infection and wound problems [23]. Similar to other abdominal procedures, complications might happen and rely on a variety of circumstances. Onlay procedures display a higher rate of complications than the laparoscopic method. The mesh's inherent properties have an impact on the result. The results are demonstrated to be affected by the type of filament used, the mesh material, the pore size, and the weight [24]. It has been shown that composite mesh enhances meshoma growth and lessens adhesions [24].

Open mesh repair methods include inlay, which sutures mesh between the fascial gaps. Polypropylene mesh has the tendency to cause significant adhesions to viscera if it is positioned in a way where it is close to bowel. This is because it anchors to all nearby tissues. This technique's well-known drawback is the mesh's potential for erosion into the intestines. Unless there is a significant tissue defect that cannot be repaired with plastic surgery on the normal layers of the abdominal wall, inlay techniques are generally not advised.

Sublay which places mesh anterior to the posterior rectus sheath [25] and peritoneum are covered with mesh. The anterior rectus sheath is then closed after allowing the rectus muscles to settle into their natural place overlaying the mesh. Following incisional hernia surgery with polypropylene mesh, the use of tissue glues between the muscle layers or between the fascial layers and subcutaneous tissue has the potential to minimize wound problems, such as seroma, and shorten hospital stays and wound care [26]. Since midline hernias are the sole condition for which the sublay technique is effective, it is less flexible and more challenging to carry out.

Use of Laparoscopy

According to systematic reviews and meta-analysis studies, there is a tendency in favour of the laparoscopic technique when comparing it to the open approach [27]. Incisional hernia is significantly less common after laparoscopic procedures compared to open surgery [28]. For intra-abdominal surgery, endoscopic access should be performed whenever possible since laparoscopic access causes far fewer small bowel obstruction and wound hernias [29]. Adhesion formation is possible when mesh and bowel are in contact after laparoscopic repair using underlay methods [30].

Use of Laparostomy

Laparostomy is utilized in situations of intra-abdominal infections and visceral oedema. A 3-l plastic irrigation bag is sutured to the wound borders and continuous high-pressure suction is performed to achieve temporary abdominal wall closure. Laparostomy wound closure can be accomplished sequentially by removing the plastic irrigation bag, letting the wound granulate, introducing split skin grafts, and then attempting definitive reconstruction; and secondly by using the components' separation method [31]. Component separation technique enables the closure of incisional hernia gaps of up to 20 cm by advancing a flap of the rectus muscle, anterior rectus sheath, and internal oblique transversus in the midline up to a maximum of 10 cm [32].

Other Methods Used in Management of Incisional Hernias

Tissue Expansion assisted closure method is very helpful for abdominal wall defects that develop after severe trauma, tumour removal, or congenital problems. Tissue expanders can be inserted into the subcutaneous or submuscular space for several months to produce tissue expansion prior to hernia repair as an alternative to

components being separated [33]. In patients with loss of domain, which suggests that some of the abdominal contents are permanently contained in a hernia sac outside of their normal compartment, the components separation technique is a helpful adjunct; however, if the volume of these contents is greater than 15% to 20% of their natural compartment, returning them will necessitate significant physiological adaptation [34].

Management of Contaminated Wounds in Incisional Hernias

In an emergency, the modified sandwich vacuum pack technique can be used to temporarily close abdominal wounds [35]. Systemic antibiotics, drainage in the event of an abscess, and mesh removal are typically used to treat mesh infections. Following mesh removal, biodegradable mesh is sutured or implanted instead, which causes less tissue reactivity. Mesh movement, sinus development, and visceral erosion can all be predisposed by infection. Mesh infection and enterocutaneous fistula are two major issues that can arise with the closure of big incisional hernias and may lead to morbidity and the need for additional surgery.

Discussion

Compared to conventional suturing methods, the recurrence rate following incisional hernia repair using mesh is much lower. Scar tissue needs to have a mesh implanted to strengthen it mechanically. No surgical procedure is inherently better than another. It is crucial to determine which surgical approach is needed for each patient based on their unique set of symptoms like urgency of surgical procedure, hernial orifice morphology, defect size, connective tissue quality, tobacco usage, diabetes, obesity, and age [15]. The International Endo-Hernia Society's guidelines recommend that laparoscopic surgery requires adhesiolysis frequently; hence surgeons doing this type of surgery should be very skilled in this operation [36]. It is recommended to favour laparoscopic surgery and non-midline incisions which are safe and practical. Suturing the fascial defect at trocar sites with a diameter of 10 mm or greater is recommended during laparoscopic surgery, especially when doing single-incision laparoscopic surgery and at the umbilicus. An elective midline laparotomy can be closed using a continuous small-bites suturing approach and a progressively absorbable suture. The death risk for complex abdominal hernias may be lowered by early identification [37]. A major obstacle to early identification is the difficulty in detecting the transition from an incarcerated hernia to a strangulated hernia by either clinical or laboratory techniques [38, 39]. If there is no strangulation and there is a possibility that bowel resection is essential, a laparoscopic approach to ventral incarcerated hernia repair may be used; otherwise, an open preperitoneal technique is advised. For the safe closure of acutely incarcerated hernias, mesh hernioplasty is essential for preventing recurrence [40]. Non-absorbable mesh repair in potentially contaminated fields was safe due to the low frequency of suppurative problems, which did not require removal of the patch or recurrences in the short term in patients with incisional hernias who underwent concomitant visceral surgery and treated with non-absorbable prostheses [41]. Contrary to above argument, researchers discovered that patients who had prosthetic mesh compared to those who did not had a considerably higher risk of postoperative infection. Regardless of other factors like drain use, defect size, or type of bowel resection, the multivariate regression analysis revealed that the only significant risk factor was the use of prosthetic mesh [42].

Conclusion

Anterior abdominal wall incisional hernias (IH) continue to be a highly morbid, difficult, and expensive surgical complication globally. This review may help surgeons in selecting the optimal approach in the management of incisional hernia. There is not enough high-quality evidence to clearly explain to surgeons which preoperative factors affect postoperative recurrence. This review summarized the current evidence base for managing incisional hernia.

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