

Contemporary Onlay Incisional Hernia Repair: Review Article

Mohamed Kamal Almasri*, AbdElhafez Mohammad Elshewail, Gamal Osman, Ibrahim Ali Heggi

Department of General Surgery, Faculty of Medicine, Zagazig University, Egypt

*Corresponding Author: Mohamed Kamal Almasri, Email: mohamed87almasri@gmail.com

ABSTRACT

Background: Abdominal procedures, whether open or laparoscopic are often complicated with an incisional abdominal hernia (IH). Approximately 15% - 20 % of all laparotomies and 1% to 5% of all laparoscopic surgeries are complicated by IHs. IH is a really bad situation for doctors and patients. Dissatisfaction, long-term malfunction, and limitations of activities and unsatisfying cosmetic appearance are just a few of the side effects that patients endure as a result of IH. For doctors; it is a challenging surgical issue associated with multiple risk factors, unclear etiology and different pathological changes, affecting different patients. Management of such a variable surgical issue necessitates a good understanding of the anatomical and physiological features of the abdominal wall by the hernia surgeon beside a wide armamentarium of surgical options to deal with complex variants to repair and restore abdominal wall integrity and function, many procedures have been utilized to repair IH and to restore abdominal wall integrity. **Objective:** To review the feasibility and safety of the abdominal wall component release with contemporary onlay mesh fixation procedure in the treatment of incisional abdominal hernias. **Conclusion:** Large incisional hernias that are difficult to close in the midline might benefit from the component separation approach. Repair of incisional hernias by abdominal wall component separation with contemporary onlay mesh fixation results in favorable outcomes and lower recurrence rates. It gives a more durable abdominal wall repair, a more physiological repair in cases of loss of domain, an affordable financial outlay, and a low incidence of complications.

Keywords: Abdominal Wall, Complications, Incisional Hernia Repair.

INTRODUCTION

Incisional hernia is referred to as protrusion of an intra-abdominal organ or tissue through a defect or defects on the musculofascial layers of the abdominal wall in the region of a postoperative scar. This may be a laparotomy or laparoscopic trocar site incisions or parastomal hernia ⁽¹⁻³⁾.

It was decided to use the definition put forward by **Korenkov et al.** ⁽⁴⁾: "IH is any abdominal wall gap with or without a bulge in the area of a postoperative scar perceptible or palpable by clinical examination or imaging". It is the most frequent postabdominal surgery complication. In spite of the vast improvement in the procedures and suture materials used to close abdominal wall incisions, its incidence continues to rise. Approximately 15% - 20 % of all laparotomies and 1% to 5% of all laparoscopic surgeries are complicated by IHs ⁽⁵⁾. Comorbid problems include persistent cough, urethral stricture, obesity, benign prostatic hyperplasia, ascites, and constipation all of them influence the result of IH repair ⁽⁶⁾.

Suture repair, prosthetic repair, laparoscopy, and a variety of other procedures and techniques have been documented for preventing and correcting IH ⁽⁷⁾. Reconstruction of the abdominal wall with the release of external oblique or transversus abdominis muscles allow repair of IH with a defect or defects greater than 15 cm or more deficit ⁽⁸⁾.

Because most IH treatments are followed by complications, despite all the work done to reduce its frequency, no one has yet come up with the optimal strategy for preventing and healing it. For surgeons of

many specialties, IH poses a significant surgical challenge ⁽⁹⁾.

Recurrence rates for open and laparoscopic procedures are practically identical ⁽¹⁰⁾.

Incisional Hernia Repair Operative Approaches:

Identifying a single, ideal surgical strategy for incisional hernia repair is difficult and in some cases, unachievable because of the wide variety of operative procedures and the wide variety of patients and hernias that can be treated. For patients having incisional hernia repair; surgeon choice and technical competence play the most significant roles in identifying the most effective surgical method ⁽³⁾.

Laparoscopic incisional hernia repairs are preferred by some surgeons who have had adequate minimally invasive training, while open incisional hernia surgeries are preferred by others. Mesh placement in a sublay, onlay, underlay, or bridge complicates the decision-making process. If fascial releases are considered, the reconstructive surgeon has a plethora of layers of the abdominal wall to release. It is still debatable whether or not a component separation should be undertaken ⁽¹¹⁾.

Even small symptomatic hernias should be repaired early. In asymptomatic hernias the risks of intestinal obstruction, strangulation and skin ulceration are such that repair, even in older patients, is often also recommended ⁽¹²⁾.

Contemporary Onlay Incisional Hernia Repair:

Onlay incisional hernia repair relies heavily on patient selection. Prior aortobifemoral bypasses, abdominal aortic aneurysm [AAA] procedures, and



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patients with established vascular compromise are not suitable candidates. Abdominal wall skin flaps should be avoided in these individuals due to a lack of collateral blood flow. Patients with diabetes, past smoking, or morbid obesity, among other risk factors for wound morbidity, must also be taken into account (13).

Recurrence is commonly used to gauge the outcome of hernia repair, so preoperative optimization is focused on removing any barriers to recovery. Smoking, obesity, DM, malnutrition, and infection are all known to have negative effects on the healing process of wounds. If there is anything that can be changed, they should be addressed and fixed before deciding to go through with an elective repair (14).

Abdominal wall component release with contemporary onlay mesh fixing for incisional hernia repair:

An existing scar and fat tissue beneath the skin are incised to achieve this sort of abdominal wall repair. A big skin flap is created on each side of the incision (15). After adhesiolysis and hernia reduction, flaps of the bilateral subcutaneous skin are elevated to allow for a mesh overlap of the midline of at least 8 cm (Figure 1). Finally, the hernia sac and devitalized tissue are excised from the fascial margins. Clamps are then used to quantify the tension in the fascia, which is then approximated. After stretching, it should be roughly 1–2 centimeters wider than the fascia when pulled together. Targeted myofascial advancement can be utilized to alleviate tension when the midline is approximated (13).



Figure (1): Creation of subcutaneous skin flap (13).

As stated by Ramirez *et al.* (16), the surgeon used a conventional, sequential components release for myofascial progression. Rectus muscle identification is critical. If the rectus muscles are retracted laterally, a good maneuver is to palpate them to help identify the initial location. After that, the posterior rectus sheath is incised around 1-2 cm from its medial edge using

cautery to separate it from the back of rectus muscle till 2 cm medial to linea semilunaris saving both superior and inferior epigastric vessels(17) (Figure 2).



Figure (2): Posterior fascial release (13).

Using a unilateral posterior rectus sheath release, the surgeon examines the midline tension of the muscle. The surgeon incises the posterior sheath on the opposite side and checks the midline again if tension remains. At the end of each stage, it is essential to evaluate the level of tension in the midline (13). A unilateral external oblique release is performed 1–2 cm lateral to the semilunar line along the length of abdominal wall to separate external oblique muscle from internal oblique muscle without disturbing nerves, arteries, and veins located between internal oblique and trans versus abdominis muscles (Figure 3), if tension still persists after bilateral posterior sheath is released (15).



Figure (3): External oblique fascial release (13).

Only bilateral obliques are released if tension persists following unilateral relaxation. The defect in the midline is repaired with a running permanent monofilament suture or interrupted polyester sutures. Running monofilament suture is put over the closure in order to create a "seamless" midline and imbricate the linea alba, according to Chevrel's approach⁽¹³⁾. Large macroporous polypropylene mesh then covers the whole belly wall, including all lateral releases. Several sutures are utilized to hold the mesh in place in all of the healing areas of exposed fascia and external releases (**Figure 4**)⁽¹³⁾.



Figure (4): Positioning of onlay mesh⁽¹³⁾.

With sutures, two to four large bore drains are inserted into the subcutaneous region. The dermal layer is closed with absorbable 3-0 sutures, and the skin is closed with a running non-absorbable suture. There is a strict postoperative protocol in place for patients who have undergone surgery, which includes requiring them to wear an abdominal binder at all times. Drains should be left in place for a minimum of 10–14 days as a general rule⁽¹³⁾.

Complications of Anterior Component Separation (ACS):

In ACS techniques, the most postoperative complication is surgical site infection (SSI), wound dehiscence, seroma, hematoma, necrosis, and recurrences^(18,19).

Postoperative management⁽²⁰⁾:

- A broad-spectrum antibiotic should be given to all patients for 5–7 days postoperatively. In the meantime, another dose of antibiotic may administered to the patients following the removal of any infected material.
- The patients should be deprived of any oral administration till they pass flatus indicating return of bowel function. Along with this other routine postoperative care, venous thromboembolism prophylaxis should be given.

- All stitches and drains removed after 14 days of the surgery or when the drains produce less than 10 ml fluid/day for a minimum duration of 48 h.
- The patients advised not to lift any heavy objects at least for 6 months.
- After the discharge, the patients are advised to visit the surgeon at an interval of 1, 2, 3 months intervals. During the visit, patients undergo physical examination to diagnose postoperative complication or recurrence, imaging techniques such as ultrasonography or computed tomography of the abdomen performed only if there is any serious concern.
- Patient demographics, defect size, body mass index (BMI), indications for surgery, associated comorbidities, details of previous surgeries (if any), operative details, duration of hospital stay, associated procedures, mesh placement, intraoperative and postoperative complications, and short-term outcomes (including infection and recurrence rate) should be reported and analyzed.

CONCLUSION

Large incisional hernias that are difficult to close in the midline might benefit from the component separation approach. Repair of incisional hernias by abdominal wall component separation with contemporary onlay mesh fixation results in favorable outcomes and lower recurrence rates. It gives a more durable abdominal wall repair, a more physiological repair in cases of loss of domain, an affordable financial outlay, and a low incidence of complications.

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