

Incisional Hernia: An Overview

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Abstract

The incidence for incisional hernias after laparotomy is 2-11 %. The incidence depends on a number of patient and technical factors. The treatment of incisional hernia is a current problem in modern surgery. This article describes the various methods of repair, including some of the newer approaches. Review of the literature reveals that tension-free mesh repair has become the standard of care for repair of most of the incisional hernias.

INTRODUCTION

An incisional hernia is represented by the escape of organs from their physiologic position through an area of weakness in the surgical scar. The frequency for incisional hernias (IH) after laparotomy is 2-11%.¹ Incisional hernia is a chronic wound failure. Ninety percent of incisional hernias occur within 3 years after the operation.²

CAUSE AND PREVENTION

The incidence depends on a number of factors including patient factors like old age, male sex, obesity, smoking, diabetes, steroid use and some surgical factors like emergency surgery, bowel surgery, suture type and technique, chest infection, abdominal distension and wound infection. There is evidence that – in many cases – wound failure after abdominal wall closure is dependent on the surgeon.³

Many of the risk factors are unavoidable, but good surgical techniques using non-absorbable or delayed absorbable suture material, good bites (>1cm), properly laid knots and avoidance of excessive tension are important. The optimal technique for closing the a midline incision is a mass closure with a non-absorbable or slowly absorbable monofilament suture (e.g. PDS) using a suture length : wound length ratio of 4:1 (Jenkin's rule). Transverse incisions are fastly gaining acceptance as they are associated with less complications and reduced incidence of wound dehiscence and IH.

To prevent port-site hernia after laparoscopic surgery, port sites (>10mm) should be closed carefully with a slowly absorbable suture.

PRESENTATIONS

Symptoms, if present, are disfigurement, discomfort or pain in most of the patients. A few patients may present with features of intestinal obstruction, strangulation or very rarely spontaneous rupture of the hernia contents.

ASSESSMENT

Clinical examination is done in the standing and supine position and the patient is asked to strain to make the hernia prominent. Edges of the defect are felt and its size is noted. The reducibility is assessed.

IMAGING

Imaging may be required in cases where the hernia is not obvious or very large and for complicated IH. Ultrasound has excellent inherent soft-tissue contrast and increasing resolution may help in the assessment of the occult hernia. CT is particularly helpful to fully assess large complex hernias, recurrent hernias or hernias with multiple defects. Assessment of the 'loss of domain' may be somewhat accurately made. Apart from diagnosis and assessment which is less commonly required, exclusion of co-existing surgically correctable intra-abdominal lesions is an indication for radiological evaluation.

TREATMENT OF INCISIONAL HERNIA

Once an IH occurs, the natural history of it is to grow. Delay in repair complicates every single aspect of the surgery and leads to increased morbidity; so repair should be done as soon as possible. If the patient is obese, weight loss is very helpful to any subsequent repair and should strongly be advised prior to ventral hernia repair. The decrease in intra-abdominal pressure that occurs with weight loss leads to a lower recurrence rate.

The treatment of incisional hernia (IH) is a current problem in modern surgery. Many important aspects of incisional hernia surgery are yet to be answered, especially the choice of surgical technique and its adaptation to the individual patient.

Preoperative measures to increase the volume of the abdomen may include creation of repeated pneumoperitoneum through intraperitoneal catheters or the use of tissue expanders placed in the subcutaneous or submuscular space.

OPEN REPAIR OF IH

There are many different techniques that have been developed for repair of IH. This is due to the fact that IH repair has a high recurrence rate (up to 50%)¹, and each new technique aims to improve the poor results. There is nearly a consensus now that tension-free mesh repair is the standard of care for IH and fascia adaptation with suture repair alone rarely has a place.

Fascia duplication and the fascia adaptation should only be used for small incisional hernias. Fascia duplication is of value only in the horizontal direction.⁴

Three general techniques used during the open mesh-repair of IH are: onlay, inlay and sublay.

THE ONLAY REPAIR

After dissection of the hernial sac, the fascial edges are brought together and the mesh is placed over the suture line making an overlap of 5 cm. The skin is closed over the mesh.

THE INLAY REPAIR

In this repair, the mesh is sutured to the fascial edges without initially closing the defect. The mesh lies in contact with the viscera. This technique has quite a high recurrence rate and may lead to bowel adhesions and development of enterocutaneous fistulas. PTFE and DacronTM meshes have been reported to have fewer of these complications. This technique is not recommended unless the substantial defect cannot be closed with other techniques.

THE SUBLAY REPAIR

In this technique, the mesh is placed beneath the rectus muscle in front of the posterior rectus sheath and the peritoneum. The anterior rectus sheath is closed. This is the most accepted technique of IH repair. The advantage of this technique is that if the mesh is much larger in surface area

than the hernia defect, intra-abdominal forces hold the prosthesis against the muscles. The forces that created the hernia now are used to prevent its recurrence (Rives-Stoppa-Wantz Retrorectus Repair).

LAPAROSCOPIC REPAIR OF THE INCISIONAL HERNIA

This is a relatively new technique and varying degrees of success have been reported. The patients undergoing laparoscopic repair have been reported to have fewer postoperative complications than those receiving open repair.³ After creation of the pneumoperitoneum and port placement, the hernial contents are reduced intraperitoneally and the mesh is placed to overlap the defect and fixed with clips and sutures. A main advantage of open repair over laparoscopic repair is the closure of rectus muscle in the midline, which gives better cosmetic and functional results.

NEWER APPROACHES

USE OF LIGHTWEIGHT POLYPROPYLENE MESHES

Standard flat meshes made from polypropylene or polyester have a tensile strength that is far greater than required physiologically. Reducing the amount of polypropylene by increasing the pore size produces a lightweight mesh that may improve the functional properties and diminish local complications. The lightweight composite mesh is the result of incorporating an absorbable component into a reduced polypropylene mass.⁶

BIOLOGICAL MESHES

Recently, a number of biological meshes have become available. They are made of human or animal tissue, their cellular component is removed to avoid allergic reactions, and then the protein structure is stabilized, so that it can act as a scaffold of collagen implant causing cellular ingrowth. These are SurgisisTM, which is made from porcine gut submucosa, AllodermTM, which is made from cadaver dermis and PermacolTM made from porcine dermis. They are expensive and probably best seen as an alternative to Vicryl absorbable mesh in contaminated situations. Long-term evaluation is needed.¹

RAMIREZ COMPONENT SEPARATION TECHNIQUE

Ramirez reported on a method of abdominal wall reconstruction without the use of mesh in 1990. This method is based on enlargement of the abdominal wall by movement of the muscular layers and can cover a defect of up to 20cm.⁷

SPECIAL CASES

Special cases of incisional hernia are the parastomal hernias, lumbar hernias, iliac crest hernias after harvest of bone for grafting, incisional hernias after nephrectomy and subxiphoid hernias.⁸

POSTOPERATIVE COMPLICATIONS

Postoperative complications are seroma formation, wound haematoma, superficial and deep wound infection, mesh rejection and chronic pain restriction of abdominal wall mobility.

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