KenKyu

Surgery Open Access 1:1-2 (2015)

Editorial

Are incisional hernias inevitable?

Gabriel Sandblom*

Department of Surgery, Karolinska University Hospital, Sweden.

Received July 25, 2015; **Accepted** July 27, 2015; **Published** July 31, 2015

Introduction

The technique for closing the abdominal wall has improved substantially in recent years. To some extent, this progress has taken place in the absence of new material development or new surgical equipment. Studies have shown that meticulous technique, using the same suture material that has been available for decades, may be sufficient to substantially reduce the risk for wound dehiscence as well as incisional hernias [1]. In spite of these advances, however, incisional hernias continue to occur. In some cases, there are obvious risk factors predisposing for the development of incisional hernias. One of the most common causes of impaired postoperative healing is surgical site infection. Co-morbidity conditions, such as anemia, hypoproteinemia, chronic obstructive pulmonary disease, malnutrition, diabetes, immunosuppression, and obesity [2] also increase the risk of incisional hernias as well as wound dehiscence.

A way of reducing the incidence of incisional hernias is to focus on patients identified as high-risk patients. In case wound dehiscence or incisional hernia may be anticipated, the risk can be reduced by applying the stitches at short interval and avoiding incorporation of fatty tissue in the stitches. Typically, a suture to wound ratio of 4:1 has been considered a threshold to minimize the risk of wound dehiscence and incisional hernia. Nevertheless, incisional hernias continue to develop, even with an optimized surgical technique. As no efforts seem to be sufficient to completely eliminate incisional hernias, they are generally considered as unavoidable late complications of the surgical procedure that have to be managed when they eventually occur.

Despite this defeatist view on the development of incisional hernias, recent studies have indicated that virtually all incisional hernias are avoidable [3]. By reinforcing the suture line with a mesh, the incidence of postoperative hernias can be reduced almost to zero.

***Corresponding Author:** Sandblom G, Department of Surgery, Karolinska Institute, CLINTEC, Stockholm, Sweden, Tel: 4670415821; E-mail: gabriel.sandblom@ki.se

However, even if preventive use of a mesh to reduce the risk of postoperative incisional hernias may seem as a solution that may be applied in any situation, the potential benefits from the mesh has to be related to the costs and risks of applying foreign material in the tissue for purely preventive purposes. A permanent mesh may cause local problems, such as persisting pain, seroma and infections [4]. The benefits should thus be weighed against the possible side-effects from the mesh.

There are several studies indicating a persisting benefit from suture reinforcement. [3,5-6] Nevertheless, leaving foreign material in the tissues inevitably implies the risk of chronic side effects from a mesh only intended to bridge the gap during the first healing phase. Although the fear of using mesh in clean-contaminated and contaminated fields has been proven to be exaggerated, [7] the risk of chronic mesh infections has not been eliminated.

Despite the side effects from the mesh, prevention remains the best way to reduce the problem of incisional hernias. Ideally, the suture reinforcement should be limited to a temporary reinforcement of the tissue, bridging over from the period from the time of the fascia closure until the fascia strength is restored. There may be some ways of avoiding the problems associated with a mesh left in situ, although the evidence is limited. Biological mesh is an option that has been tested, although the high costs do not make them suitable for preventive use. Recently, two synthetic meshes have been introduced in clinical routine [8-9]. Further studies are, however, necessary to assess whether they are effective, safe and cost-effective.

Despite the fact that abdominal wall closure for a long time has been considered a surgical routine that may be handed over to surgeons under training without great concerns about the surgical outcome, recent research has shown that the outcome may be substantially improved with a better awareness of the surgical technique and, perhaps, better sutures and mesh. There are reasons to believe that research the coming decade will continue to show new ways to reduce incisional hernias as well as wound dehiscence, [10-11] surgical site infections and persisting pain.

References

1. Israelsson LA, Millbourn D (2013) Prevention of incisional hernias: how to close a midline incision. Surg Clin North Am, 93: 1027-1040.
2. Itatsu K, Yokoyama Y, Sugawara G, Kubota H, Tojima Y, et al., (2014) Incidence of and risk factors for incisional hernia after abdominal surgery. Br J Surg, 101: 1439-1447.
3. García-Ureña MÁ, López-Monclús J, Hernando LA, Montes DM, Lersundi ARVD, et al., (2015) Randomized controlled trial of the use of a large-pore polypropylene mesh to prevent incisional hernia in colorectal surgery. Ann Surg, 261: 876-881.
4. Herbert GS, Tausch TJ, Carter PL (2009) Prophylactic mesh to prevent incisional hernia: a note of caution. Am J Surg, 197: 595-598.
5. Timmermans L, Eker HH, Steyerberg EW, Jairam A, de Jong D, et al., (2015) Short-term results of a randomized controlled trial comparing primary suture with primary glued mesh augmentation to prevent incisional hernia. Ann Surg, 261: 276-281.
6. Tarrago AC, Casas CO, Salido AJ, Guilera ED, Fernandez FM, et al., (2014) Prevention of incisional hernia in midline laparotomy with an onlay mesh: a randomized clinical trial. World J Surg, 38: 2223-2230.
7. Choi JJ, Palaniappa NC, Dallas KB, et al., (2012) Use of mesh during ventral hernia repair in clean-contaminated and contaminated cases: outcomes of 33,832 cases. Ann Surg, 255: 176–180.
8. Deeken CR, Matthews BD (2013) Characterization of the Mechanical Strength, Resorption Properties, and Histologic Characteristics of a Fully Absorbable Material (Poly-4-hydroxybutyrate-PHASIX Mesh) in a Porcine Model of Hernia Repair. ISRN Surg, 2013:238067.
9. Hjort H, Mathisen T, Alves A, Clermont G, Boutrand JP (2012) Three-year results from a preclinical implantation study of a long-term resorbable surgical mesh with time-dependent mechanical characteristics. Hernia, 16: 191-197.
10. Bellón JM, Pérez-López P, Simón-Allue R, Sotomayor S, Pérez-Köhler B, et al., (2014) New suture materials for midline laparotomy closure: an experimental study. BMC Surg, 17: 14-70.
11. Plencner M, East B, Tonar Z, Otáhal M, Prosecká E, et al., (2014) Abdominal closurereinforcement by using polypropylene mesh functionalized with poly-ε-caprolactone nanofibers and growth factors for prevention of incisional hernia formation. Int J Nanomedicine, 9: 3263-3277.