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Review article

Incisional Hernia Prevention and Use of Mesh. A Narrative Review[☆]

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A B S T R A C T

Incisional hernias are a very common problem, with an estimated incidence around 15%–20% of all laparotomies. Evisceration is another important problem, with a lower rate (2.5%–3%) but severe consequences for patients. Prevention of both complications is an essential objective of correct patient treatment due to the improved quality of life and cost savings.

This narrative review intends to provide an update on incisional hernia and evisceration prevention. We analyze the current criteria for proper abdominal wall closure and the possibility to add prosthetic reinforcement in certain cases requiring it. Parastomal, trocar-site hernias and hernias developed after stoma closure are included in this review.

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Profilaxis de la hernia incisional y utilización de mallas. Revisión narrativa

R E S U M E N

La hernia incisional es una patología muy común cuya incidencia se estima en torno al 15–20% de todas las laparotomías. La evisceración es otro problema importante, con una incidencia menor (2,5–3%) pero con graves consecuencias para el paciente. Por todo ello,

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la prevención de ambas complicaciones surge como un objetivo fundamental para el tratamiento correcto de los pacientes, por la mejora de la calidad de vida y por el ahorro de costes que supondría.

Esta revisión narrativa pretende realizar una puesta al día en la prevención de la hernia incisional y la evisceración. Se analizan los criterios actuales para el cierre correcto de la pared abdominal, seguido de la posibilidad de añadir refuerzos protésicos en aquellos pacientes o casos que así lo requieran. Eventraciones especiales, como las originadas tras la inserción de trócares de laparoscopia o las secundarias a la realización de un estoma, se incluyen también en este trabajo.

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Introduction

Incisional hernias (IH) are one of the most common pathologies treated by the General Surgery Department. The incidence of IH is around 15%–20%, although it can reach 50% in certain contexts.¹ This means a large number of patients to be treated, with the corresponding high consumption of resources. In the United States, for example, two million laparotomies are performed each year,² and more than 100 000 incisional hernias are treated surgically. In addition, a significant percentage can present serious complications, such as incarceration, strangulation or bowel obstruction that will require urgent surgery. Evisceration is another serious problem that can arise after laparotomy, with an approximate incidence of 2.5%–3%³ but a mortality rate of 45% and very high morbidity, which is close to 75%.

All the incisions that are used to access the abdominal cavity, whether midline laparotomies or incisions to introduce trocars in laparoscopic approaches, can potentially develop IH. In addition, there are well-known risk factors⁴ that increase the chances of the patient having an IH, such as obesity, urgent surgery, smoking, abdominal aortic aneurysms or the appearance of postoperative wound infection. For all these reasons, the prevention of IH has emerged as a fundamental objective for correct patient treatment due to the improved quality of life and cost savings that it would entail.

The objective of this study was to provide a narrative review about the prevention of IH and evisceration. First, we describe the aspects related with correct closure of the abdominal wall, followed by the possibility of using prosthetic reinforcement in those patients or cases requiring it. Special cases of incisional hernias, such as those caused after the insertion of laparoscopy trocars or those secondary to the completion of a stoma, are also contemplated in this paper.

Correct Abdominal Wall Closure

The IH rate in a midline laparotomy is estimated at around 15%–20% (50% in some risk groups) and the evisceration rate is

around 3%, which makes it an important problem.^{1,3} In the last 20 years, clinical, experimental and meta-analysis studies have been published to determine the best materials and methods for abdominal wall closure.^{1,5}

The recommendations made based on these studies established that correct closure should be done with continuous suture, in a single plane and with slow-absorption suture material.^{1,5} In addition, other clinical and experimental studies^{6,7} have demonstrated that for greater effectiveness of a continuous suture, this should be done with a suture length/wound length (SL/WL) ratio of 4:1 or higher, as described by Jenkins⁶ and known in the literature as “the 4:1 rule.”

An SL/WL ratio of less than 4:1 has been shown to be one of the main technical factors associated with the appearance of IH, and some authors even recommend redoing the suture if the suture/incision ratio is not met adequately.^{7,8} This “rule” is simple to apply: you only need a tape measure and very simple calculations.⁸

The next evolution in abdominal wall closure was the change in the size of the suture and the distance between stitches. In previous studies, the closure was done with heavy-gauge sutures (0/1), with a separation of 1 cm between stitches and a distance to the aponeurotic edge of another 1 cm (called the “large stitch” or “large bite” technique), thereby achieving an SL/WL ratio greater than 4:1.⁷ Israels-son’s group described the completion of closure with smaller stitches that were 5 mm apart and a distance to the edge of 5–8 mm, using a smaller suture gauge (2/0) and small needle.⁹ This change ensures reaching the 4:1 or higher ratio, and also demonstrates a lower incidence of IH and a lower rate of wound infection than with the large-stitch technique.⁹ This technique has been called “small stitch” or “small bite” method.

The results of this first study⁹ have been confirmed in the STITCH¹⁰ trial, which compared closure with a polydioxanone 1/0 loop mounted on a 48-mm needle using the large-stitch technique versus polydioxanone 2/0 caliber mounted on a 31-mm needle using the small-stitch technique, finding a significantly lower IH rate with the latter.

The European Hernia Society (EHS) has developed Clinical Guidelines for the closure of abdominal wall incisions¹¹ based on the GRADE methodology.¹² The recommendations that

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