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Study of recurrences after anterior open tension-free hernioplasty

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Summary: The anterior open tension-free hernioplasty popularized by the Lichtenstein group has gained world-wide acceptance and popularity. As described by the same group, utilization of a small sheet of mesh and failure to overlap the mesh with the pubic tubercle can lead to recurrence of the hernia. However, recurrence through the internal ring has not been reported. We report three recurrences from the internal ring area after open tension-free hernioplasty. The cause is discussed and the importance of making a mesh shutter mechanism at the internal ring in order to prevent indirect recurrence, is emphasized.

Key words: Reccurrences – Anterior – Open – Tension-free – Hernioplasty

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Analysis of recurrences following different methods of hernia repair is an important aspect of any series. Through better understanding of the mechanism of recurrence, the surgeon is able to refine the technique and thus prevent the recurrence. However, surgeons rarely have the opportunity to repair their own recurrences, and indeed, in most series, the reason for recurrence following the use of a specific operation is not described. The anterior open tension-free mesh repair of inguinal hernia, described by the Lichtenstein group [Amid 1998], has simplified the application of tension-free principles compared with other techniques which place the prosthesis in the properitoneal space [Stoppa 1984]. The former allows routine performance under local anesthesia in an ambulatory facility and achieves the same or a lower recurrence rate but with a shorter period of disability. In a critical scrutiny of their own procedure, Amid et al reported that inadequate mesh size and failure to overlap the mesh with the pubic tubercle can lead to recurrences below or above the mesh or at the pubic tubercle [Amid 1993]. This observation led to the group's recommendation to overlap the mesh with the pubic tubercle and utilize a wider mesh in order to provide sufficient contact between the mesh and tissue beyond the inguinal floor, as well as to provide adequate laxity for the mesh to compensate for the increased intra-abdominal pressure. The importance of using a wider mesh and allowing a certain degree of laxity became more obvious when they proved that after implantations the mesh decreases its size up to 20% due to shrinkage [Amid 1997]. The purpose of this article is to report another cause of recurrence : when construction of the internal ring is not made in such a way

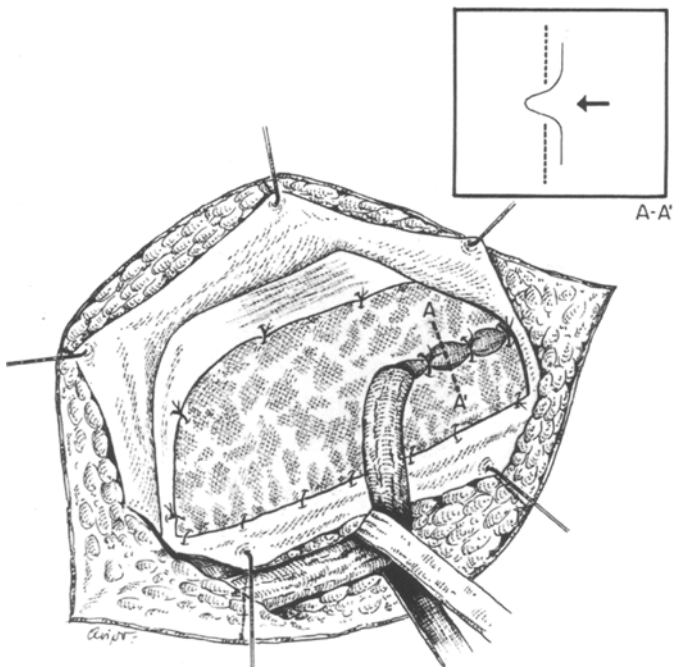

Fig. 1
Repair made without crossing the tails, in which keyhole hernias (sagittal view, A-A') may appear among the suture stitches when intraabdominal pressure (arrow) increases

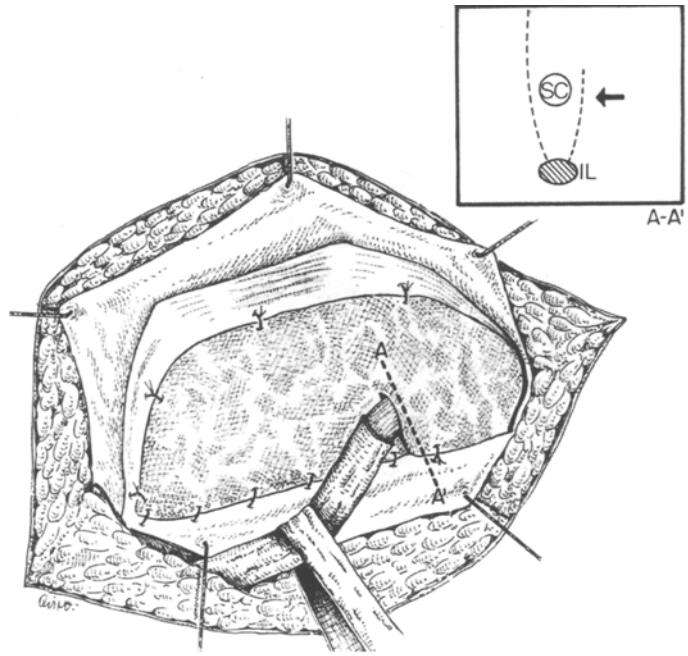

Fig. 2
Original Lichtenstein technique, in which the spermatic cord (SC) runs between the two closed tails (sagittal view, A-A') and the deep inguinal ring remains closed when intraabdominal pressure (arrow) increases (IL: inguinal ligament)

as to create a shutter mechanism as described in the original Lichtenstein technique [Amid 1998].

Patients and results

From October 1991 to December 1997 320 inguinal hernias were operated on, in 296 patients by one of the authors (AC) or residents assisted by him. Mean follow up was 44.6 months (range 23 to 98). A 54-year-old man presented asymptomatic recurrence through the deep ring close to the spermatic cord 44 months postoperatively. Symptomatic recurrences were found in the same area in two referred patients: a 73-year-old man 12 months after the original repair, and a 75-year-old man 9 months following repair. In all three cases, the mesh had been placed between the external oblique aponeurosis and the inguinal floor as described by the Lichtenstein group. However, in all three, the slit made in the patch for the emergence of the spermatic cord was closed by interrupted sutures in an edge-to-edge fashion lateral to the cord (Fig. 1), instead of crossing the tails of the mesh in order to produce a sling configuration similar to the transversalis fascia sling. In all these cases, the recurrence occurred from the slit and in between the interrupted sutures. These recurrences were repaired by inversion of the hernia sac and creation of a new internal ring using of a new sheet of mesh as described by the Lichtenstein group. The patients have not presented a new recurrence after follow up of 45, 36 and 31 months.

Discussion

Closure of the slit made in the patch for emergence of the spermatic cord by edge-to-edge closure can result in keyhole recurrence (Fig. 1). This type of recurrence has also resulted from properitoneal placement of the mesh where the spermatic cord emerges from the slit [Lowham 1997]. This problem was resolved by Stoppa, who recommended parietalization of the cord in order to avoid slitting the mesh. Insertion of a plug into the internal ring in order to avoid indirect recurrence is frequently unsuccessful due to shrinkage of the plug [Amid 1997; Amid 1998; Gai 1998]. When the plug shrinks, its anchoring suture to the area of the internal ring pulls through the tissue. The resultant defect next to the plug then leads to recurrence of the hernia. More important, after shrinkage the plug becomes an abrasive hard foreign body which reportedly can erode into the adjacent structures such as the bladder [Amid 1997; Hume 1996], intestine [Gilbert 1998; Danielli 1997], and major vessels [Cristaldi 1997]. Furthermore, after the anchoring sutures of the plug are pulled from the surrounding tissue, the plug can migrate into the scrotum [Amid 1998; Dieter Jr. 1999].

In 1945, Lyttle [Lyttle 1945] described a strong U-shaped fibrous strand of varying length attached to the posterior aspect of the transversalis fascia at the emergence of the spermatic cord from the internal ring. Coughing and straining lead to upward pulling of this sling and closure of the internal ring with increased intra-abdominal pressure. Crossing the tails of the mesh creates a

sling configuration similar to that described by Lytle, duplicating the physiologic mechanism of the internal ring shutter and thus preventing recurrences from the area of the internal ring (Fig. 2). The effectiveness of this method has been proven by the experience of the Lichtenstein group, who report no indirect recurrences in 5000 tension-free hernioplasties [Amid 1998].

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