

Tack Sinus: A New Complication of Laparoscopic Ventral Hernia Repair

Bharati Vishwanath Hiremath, Bharathi Rajasridhar, Gotam Pipara

ABSTRACT

In this era of laparoscopic surgery, laparoscopic repair of ventral hernia is gaining popularity due to faster recovery, shorter hospital stay and lower recurrence rates. In obese patients it is a technically easier procedure than open repair. However, this new method requires advanced technologies. Transfacial sutures and tacks are the usual methods to fix the mesh to the anterior abdominal wall. These methods, however, have their own complications. This article is to report an unusual complication of tacks migrating and trying to extrude out of anterior abdominal wall, forming chronic sinuses.

Keywords: Laparoscopy, Tack, Sinus.

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INTRODUCTION

Laparoscopic ventral hernia repair (LVHR) has gained popularity over the recent years ever since introduced by Karl Leblanc in 1992. It has a number of advantages over traditional open hernia repair.¹ It continues to gain popularity because of its low rates of complications and hernia recurrence and short hospital stay and short recovery times.² There are various methods of mesh fixation. Currently, two methods of mesh fixation are commonly employed. One involves placement of both transabdominal sutures (TAS), either absorbable or nonabsorbable, and tacks; the other entails insertion of two circles of tacks without TAS [the double-crown (DC) technique].³ Numerous studies have proven that transfacial sutures are a must for fixing the mesh in terms of strength while the tacks provide extra reinforcement. However, fixing with transfacial sutures takes a longer time⁴ and is a more tedious process. Tacks are used in laparoscopic ventral hernia repair to decrease the operative time and the number of subcutaneous prolene knots of the transfacial sutures are used. Moreover, the ease of their application makes their use even more appealing.

However, usage of tacks has its own disadvantages and complications. Besides being expensive, various complications have been reported like tack site pain,⁵ tack hernia,⁶ recurrence of hernia⁷ and seroma formation. This is a case report of a new complication that has not been

reported so far in literature, i.e. migration of tacks through the anterior abdominal wall forming multiple sinuses which henceforth may be referred to as 'tack sinus'.

CASE REPORT

A 50-year-old diabetic lady, underwent elective laparoscopic paraumbilical mesh hernia repair on 25.06.10 under general anesthesia. Two ports were used. One 10 mm port at Palmar's point and a 5 mm port placed laterally in the left flank. All adhesions were released. Dual mesh was introduced through the 10 mm port. This mesh was sized to lie 3 cm beyond the size of the defect. It was fixed with prolene transfacial sutures at all the four corners and in the center at the site of the defect. The fixation was further enforced by using tacks (nonabsorbable helical titanium) at the periphery and around the defect (DC method). Total number of 15 tacks were used. Postoperative recovery of the patient was uneventful and patient was discharged on 2nd day postoperative. Port site sutures were removed on 8th day.

She presented 8 weeks later with two discharging sinuses on the anterior abdominal wall in the infraumbilical region. The serous discharge and scrapings from these sinuses was thoroughly investigated by culture sensitivity of the discharge for routine and tuberculous culture and sensitivity. acid-fast bacillus (AFB) staining of the discharge showed no tuberculous bacilli. There was no growth seen in either of the cultures. Patient was treated with regular curettage and dressings. Patient was, however, lost to follow-up.

This patient presented to us again in the month of October 2011. At this visit she had four discharging sinuses in the infraumbilical region. This time too the discharge was serous in nature. Induration was felt at the site of the discharging sinuses. A soft tissue scan of the anterior abdominal wall showed these sinus tracts extending up to the fascia only. The lower two of these sinuses were multi-truncated. An exploration and excision of these sinuses was planned.

Intraoperatively, it was seen that these sinuses were formed of very thick fibrous tissue. To our surprise two of these sinus tracts had the spiral tacks in them above the level of fascia. These tacks had dragged the mesh along with them. A few millimeter length of the mesh was protruding in each of these two sinuses. However, the mesh

did not look infected. These sinus tracts along with the bit of mesh were excised (Fig. 1). The other two sinus tracts contained the prolene sutures used for transfacial fixation of the mesh (Fig. 2). All these sinues extended from the skin upto external oblique aponeurosis only.

After excising the tracts, defects in the external oblique aponeurosis were closed with 1-0 prolene (Fig. 3). Since, the mesh did not look infected and all cultures were negative, a decision was made not to remove the mesh. A primary closure of skin and subcutaneous tissue was done. Patient did well postoperatively. All wounds healed well and now patient is 5 months postoperative and doing well.

DISCUSSION

Laparoscopic repair of ventral hernia was introduced in the early 1990s. Since, then newer and newer methods of mesh fixation are being introduced. Majority of the published reports advocate the mandatory use of transfacial sutures⁸ and further fixation may be achieved by various fixation devices available. Park et al first popularized the use of

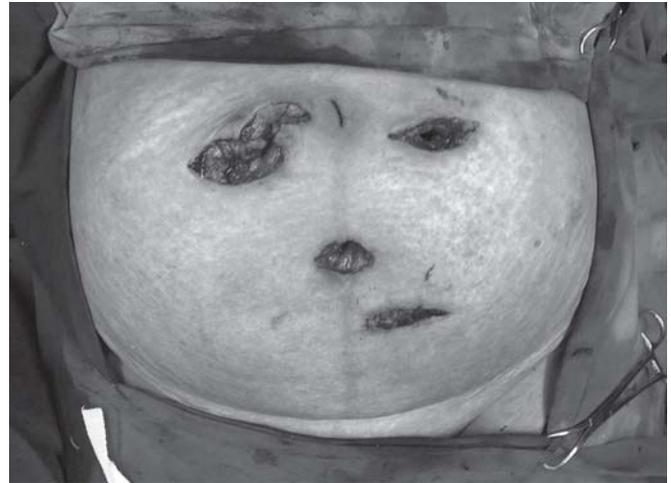


Fig. 3: After sinus excision

sutures in 1996.⁹ In recent times different types of fixation devices are available for reinforcing the fixation of the mesh. A few types of such tacks available are compared in the table below:

LVHR involves using a mesh and fixing it to the anterior abdominal wall using sutures and fixation devices. Transabdominal prolene nonabsorbable sutures are used to fix the mesh. However, the chief disadvantage is that the knots of these sutures can be felt in the subcutaneous plane and can cause significant discomfort to the patient. Moreover, application of these sutures is a tedious process. With different types of fixation devices e.g. tacks being available over the recent years and the ease of their application has made their use more appealing. The list of these fixation devices is as shown in the Table 1. Of these the most commonly used ones are tacks. Nonabsorbable titanium helical tacks are deployed through the mesh to fix it to the anterior abdominal wall (peritoneum to preperitoneum). They are compatible with magnetic resonance imaging and inert in tissue. However, the use of



Fig. 1: Contents of sinus tracts



Fig. 2: Sinuses with sutures and tacks

Table 1: Few of the types of tacks available		
Type	Composition	Degradation
Absorbable ethicon SecureStrap™ 5 mm strap device	Blend of polydioxanone dyed with D and C violet #2 and an L lactide/glycolide copolymer	Hydrolysis by 12 to 18 months
Absorbable 5 mm spiral tapered construct AbsorbaTack™	Synthetic polyester copolymer derived from lactic and glycolic acid	Hydrolysis by 1 year
Absorbable 5 mm spiral construct Sorbafix™	Poly (D, L)-Lactide (PLA)	Degrades by 1 year post-implantation
Nonabsorbable titanium helical fastners protack	Titanium	

tacks has its own disadvantages. Acute problems that occur with nonabsorbable tacks may be related to patient characteristics such as morbid obesity, to difficulty getting the tack to penetrate and secure the mesh adequately and various device malfunctions.¹⁰

Tacks are known to cause pain like transfacial sutures. Even though a permanent metal tack is not reactive in the sense of causing allergy there is still inflammation around it and inflammation near a nerve running through a muscle causes pain that can be quite disabling⁸ similar pain can be noted with absorbable tacks but its absorption will decrease the pain to a considerable limit. The only issue of concern, however, with absorbable tacks was the over all strength of attachment to abdominal wall. Recurrence of hernia with only the use of tacks is higher when compared to reinforcement of the mesh with transabdominal sutures. Hence, suture fixation was stronger than tacks alone.⁸

Two incidences of tack site hernia have been reported. The hernial defect was seen between the sutures rather than the site of suture evidently showing that tacks were responsible for the same.⁶ Seroma formation is a common complication after LVHR.⁸

Migration of tacks can occur if not appropriately placed and they can drop into the peritoneal cavity and serve as lead points causing small bowel obstruction at any point in the near or distant future.¹⁰ The length of these helical tacks is 4 mm and width is approximately 3 mm. This penetrates approximately 3 to 4 mm into these tissues.

We, however, encountered a case of migration of tacks, not a case of drop into the peritoneal cavity, but migration to the anterior abdominal wall forming multiple sinus tracts. This discovery of tacks migrating anteriorly toward the abdominal wall is a completely new finding. Our patient had an obese abdomen and a thin anterior abdominal wall was not encountered to give these tacks an easy way out. Two of these sinuses had spiral tracks along with which a part of the mesh was also protruding. The fact that these tacks were placed in between prolene sutures makes it unlikely that the latter was responsible for migration of these tacks. Is it possible that the spiral design helps propel the tack every time there is a sudden rise in intraperitoneal pressure? And due to their nonabsorbable nature is it possible that migration of these tacks may occur years later?

CONCLUSION

Tacks are a convenient and quick way of fixing a mesh in LVHR. However, their use has its own complications like

pain, mesh migration, hernia, etc. As more and more LVHRs are done these complications are being reported, and one needs to be aware of these in order to tackle them rightly or better still avoid them. Newer technologies may help manufacture better configured and bioabsorbable tacks.

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