Migrating Helical Tack Causing Chronic Discharging Sinus Following Laparoscopic Ventral Hernia Repair: A Case Report

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Abstract

Choice of prosthetic mesh and secure anchorage to its bed is key to successful laparoscopic repair of a ventral hernia. Transfascial suture and tack are two commonly used techniques for mesh fixation. While transfascial suture causes more post-operative pain, tack’s anchorage is a suspect. Spiral tacks are inert and cause less tissue reaction. Though isolated case reports are available regarding pain and intestinal complications arising from the use of tacks, the incidence of tack migration through the fascial layer and causing discharging chronic sinus mimicking mesh infection has been reported only once. Surgeons should be aware and cautious about using new technologies to provide correct management strategy in individual cases of complications arising from them, rather than treating them empirically. As complications can arise even after years of primary surgery, a longer period of follow-up is essential for comparative evaluation of different techniques.

Keywords: Hernia, Infections, Laparoscopy, Titanium

INTRODUCTION

Technology and surgical techniques have revolutionized hernia repair in the last 20 years. The spectrum of options ranges from open suture repair to laparoscopic mesh repair, which has gained widespread acceptance since the early nineties. In fact, it has now set itself as the new standard of care for ventral hernia repair, with low recurrence, reduced hospital stay, and fewer infective complications. Simultaneous research has given us options to choose from regarding the type of prosthetic mesh and its fixative tools to prevent mesh migration during the healing phase of hernia repair. The evolution process is still continuing as unexpected and newer complications keep cropping up from the individual type of prosthesis’ and its fixative devices. Mesh infection is a rare, but significant morbidity that surgeons and patients want to avoid alike. Anchorage devices vary in tensile strength, user convenience and causing postoperative chronic pain. Though helical titanium tacks are user-friendly, its effectiveness regarding firm anchorage is debatable when used as the sole means of fixation. Parietal migration of such helical tack through the fascia dragging a portion of attached mesh with it, which results in late and chronic discharging sinus is not mentioned in literature barring one. The reported case describes one such occurrence.

CASE REPORT

A 34-year-old female who underwent laparoscopic cholecystectomy for symptomatic gallstone disease in early 2011 developed an umbilical port site hernia 3 months post-operatively. Initially asymptomatic, the umbilical hernia gradually enlarged in size and became symptomatic with occasional local pain. She came to us in September 2013 for repair of the hernia. She was a generously built lady with a midline infra umbilical scar from the previous cesarean section. After assessment and counseling, a laparoscopic repair was planned and done through left flank approach. On dissection of the hernia sac, a circular composite mesh of polypropylene-polytetrafluoroethylene with a diameter of 10 cm was placed to cover the hernia defect of 2 cm ensuring adequate overlap. Four transfascial polypropylene sutures were used as stay sutures at the peripheral margin of the mesh. Two in the midline on either side of umbilicus and two in the flank. Two rows of helical spiral tack were used as in double crowning technique. Everted umbilicus was repositioned back for proper contour. She had an expected...
recovery and was discharged on 2nd postoperative day. Being a working women she started her office work 3 weeks after surgery. She remained well till early 2015 when she developed localized pain in the infra umbilical region that developed into a pustule. The pustule spontaneously drained few drops of purulent discharge with relief of pain. Subsequently, she did not have any local or constitutional symptoms of infection, corroborated by normal white cell count. At this point of time, she consulted her family physician, who requested Gram staining and bacteriological culture of the scantly discharge which became essentially serous by then. Both the Gram-staining and culture report were negative for infectious etiology.

On persistence of discharging sinus she reported to us in February 2015 with an ultrasound (U/S) scan report that showed no collection around the mesh, but delineated a sinus tract extending up to the muscle layer without any intra-abdominal extension. Clinical examination revealed the sinus was situated in the midline 3 cm below the umbilicus, without any surrounding redness and tenderness (Figure 1). The discharge was serous. Repeat gram and acid-fast bacilli staining with culture for bacteriology including for tuberculosis was asked for along with a magnetic resonance imaging (MRI) scan of the area. MRI corroborated U/S findings (Figure 2), and staining and culture were reported negative for bacterial growth. In the meantime, the patient took opinion from several surgeons, some of them advised her operative removal of the mesh which they believed was infected. However, two different negative bacteriological reports, radiological findings as mentioned above in an afebrile patient made us think of a non-infective cause of the persistent sinus. After detailed consultation with the patient and her family members, the sinus was explored under general anesthesia with the option of operative removal of entire mesh if required. An elliptical incision was made around the opening of the sinus, which on probing gave a metallic grate at a depth of about 4 cm. At the depth of the sinus, a small non-purulent collection was drained, and a small portion of the mesh was seen herniating through the fascia capped by a helical tack still attached to the mesh. The herniated portion of the mesh which did not bear any stigma of infection was resected (Figure 3). No evidence of any further collection was found below the fascia in the vicinity of the rest of the mesh. The small hole in the fascia through which the tack and attached portion of mesh herniated was closed with two interrupted prolene suture. The resected portion of mesh and the drained collection was sent for bacteriological study, which subsequently reported negative for bacterial infection. The wound was partially closed with interrupted skin suture leaving a portion to heal by secondary intention (Figure 4). The wound healed completely in 4 weeks’ time with a pigmented scar (Figure 5). The patient is doing well in 6 months follow-up, without any recurrence of the discharge.

**DISCUSSION**

Controversies exist regarding means to fix the mesh to the anterior abdominal wall in laparoscopic ventral hernia repair (LVHR). Two most popular alternatives are transabdominal sutures and laparoscopic tacks, either absorbable, or non-absorbable types. While transfascial sutures pass through all the layers of abdomen including fascia and muscles,
providing good tensile strength of anchorage, the helical tacks and staples does so within few millimeters of innermost peritoneum fixing it and the mesh to the pre peritoneal tissues, thus not giving the secure anchorage of transfascial sutures. This apparent disadvantage of helical tacks is compensated with fewer incidences of the postoperative pain of neuralgic or ischemic etiology which is common with transfascial sutures. High tensile holding strength of sutures causes lesser recurrence rate in comparison to tacks, as the most important cause of recurrence is inadequate sized prosthesis that is fixed to abdominal parietes inappropriately. Proponents of tack users advocates its use for reason of reduced operating time while maintaining similar recurrence rate and lower incidence of post-operative pain.

Apart from being expensive, non-absorbable helical titanium tacks have been implicated with tack site pain, and intestinal obstruction when inappropriately applied tack falls into peritoneum cavity. On the positive side, it reduces operative time by an easy and convenient application. However, tack migration into abdominal parietes is not reported in the literature except one. The helical tack with the length of 4 mm and diameter of 3 mm has a sharp end pointing towards the abdominal wall after application (Figure 6). Sudden intra-abdominal rise of pressure due to muscular activity aided by its design may cause it to penetrate the fascial layer dragging its attached portion of mesh in the subcutaneous space, which evokes a strong foreign body (FB) reaction resulting in a sinus with sterile discharge from inflammatory reaction.

Infected mesh presenting with solitary or multiple discharging sinuses is mentioned in literatures. The universally accepted treatment in such scenarios is the operative removal of the infected mesh, which completely reverses the initial surgical planning. In South East Asia, we often encounter a particular infection associated with all forms of laparoscopy caused by an atypical mycobacterium. The presence of prosthetic material in the field of infection, as happens in LVHR makes the management of such cases far more challenging and causes enormous physical and psychological trauma to the suffering patients. After mandatory removal of the infected mesh, patients also require anti-tubercular therapy for 6 months. It is thus, especially important to differentiate between a non-infective and infective sinuses developing after LVHR, as the management of them are different. While a non-infective, FB induced sinus can be cured by relatively conservative surgery without the need for removal of the mesh, a sinus associated with mesh infection needs far more radical treatment with operative removal of the entire mesh.

Thus, every sinus that develops after LVHR should not be presumed to be due to mesh infection requiring removal of the mesh. Clinical findings with bacteriological staining and culture including that for tuberculosis, of the sinus discharge should be obtained for every such case. Radiological confirmation with U/S computerized tomography or MRI should be requested before a decision is made to remove the entire mesh as part of further management of the patient.

Persistent sterile sinus discharge without supporting clinical and radiological findings of associated local infection should raise the possibility of FB reaction as a cause of discharge either due to knot from prolene sutures.
or from a migrated helical tack. Awareness on the part of treating clinicians is desirable to avoid an avoidable and unnecessary surgical procedure like the operative removal of mesh in such a patient.

**CONCLUSION**

Supported by advanced technology laparoscopic procedures are replacing conventional open procedures as gold standards. With newer technology, new complications are coming up. To deliver the stated benefits of laparoscopy to our patients, we should strictly adhere to proper surgical techniques and reliable technology. Even a reliable and time-tested technology tool can produce unexpected complication and confuses the clinician. In the reported case, the patient underwent laparoscopic cholecystectomy and LVHR by two different surgeons, and on both occasions she developed complications. Port site herniation could have been avoided by the secured port closure. The discharging sinus as a sequel of migrating tack is a relatively unrecognized complication of using spiral tack that we should be aware of for devising correct management strategy. The article reminds us that laparoscopy can be the cause and cure for a hernia.

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**REFERENCES**


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