Abstract:
Herniation through drain site is a rare but recognized complication of surgical drainage. Once detected they should be managed aggressively since incidence of obstruction is higher. We herein present two cases of drain site hernia which we encountered in our unit between Aug 2009 to Aug 2011. We reviewed the case reports of these patients and analyzed them retrospectively. The risk factors for the development of drain site hernias in these patients were identified. The modalities to prevent these risk factors and to make drain site hernia as an avoidable complication were formulated. We identified the main predisposing factors for drain site hernia as sepsis, faulty technique in placement and management of drains. Management varied based on their site, nature, duration of presentation. One case presented as emergency which we managed by open technique, while the second case was repaired electively using laparoscopic technique.

Keyword: drain site hernia, obstruction, drain insertion, laparoscopic mesh repair.

INTRODUCTION:
HERNIATION THROUGH A DRAIN SITE is a rare but recognized complication of surgical drainage (1) and is considered as a type of incisional hernia. Incisional hernias can form in the incision site, drain sites, or port sites. Drain site hernias are more prone to cause early intestinal obstruction and strangulation; so immediate surgical repair is mandatory. In this paper, we report our experience with two patients of drain site hernias - one repaired by open technique and one underwent a simple technique of laparoscopic repair.

CASE REPORTS: CASE 1. 40 yr old male with swelling in right iliac fossa for 8 yrs, presented to us with complaints of abdominal pain.
, abdominal distension and vomiting 2 days. He also gave history of not passing stools & flatus for one day. On examination he had an upper midline laparotomy scar with a swelling of size 10 x 8 cm over drain site scar in RIF. We also noted visible intestinal peristalsis over the swelling. He gave history of laparotomy for perforative peritonitis 10 yrs back, and also mentioned some drain tube had been inserted at the same site for about 10 days.

**CASE 1: Herniation at the drain site with no herniation at the main laparotomy wound**

Abdomen X-ray erect view revealed dilated small bowel loops with multiple fluid levels.

**X-ray showing dilated bowel loops**

**Ileal loops were seen as content**

Hence a diagnosis of obstructed drain site hernia was made. We proceeded with emergency surgery, a transverse incision was made over the mass, skin flaps raised, adhesions between skin and sac released, sac was opened and multiple loculations within the sac were released. Contents were ileal loops. Constriction ring of the sac was released, viability of the bowel confirmed and hence bowel returned back into abdominal cavity. We sutured the fascial defect with no.1 prolene, continuous interlocking sutures and fixed a vypro mesh over the defect. A suction drain was kept. The post operative
2. **CASE 2**: 45 yr old male with history of stab injury abdomen for which laparotomy and diaphragmatic repair was done 10 yrs back, came to us with swelling and pain in right drain site for 1 month. On examination, he had an upper midline laparotomy scar, with impulse on coughing at right drain site.

**CASE 2: Impulse on coughing was seen at the right drain site**

USG revealed a defect of size 2 cm in right drain site, but there was no defect in the midline scar. Since the patient presented with a reducible swelling with no other complications, we planned for an elective laparoscopic repair of the drain site hernia.

**Laparoscopic view showing omentum as content**

**Anatomical repair of the defect being done laparoscopically**

During the laparoscopic repair, the hernia sac was first reduced with a combination of monopolar hook and scissors. Next anatomical repair of the fascial defect was done using No.1 prolene. A Vypro mesh was used to cover this defect and was fixed with no.1 prolene. The post operative period was uneventful.

**DISCUSSION:**

Herniation through a drain site has been mentioned as one of the complications of intraperitoneal drains. Several studies have demonstrated the correlation of drains with intra-abdominal and wound infections, adhesions, intestinal erosion, increased abdominal pain, decreased pulmonary function, bleeding and anastomotic ruptures. Herniation of the bowel sometimes occurs after surgery through a dehiscent wound, particularly in patients with poor nutritional status, obesity, ascites, severe abdominal infection, or with persistent cough. Steroid therapy, chemotherapeutic agents have also been implicated as a cause of herniation(2). Injury to motor nerves supplying...
the area has also been identified as a risk factor. Surgical site infection is the most important predisposing factor for development of a drain site hernia. “Drains drain both ways”. “Passive drains” which are considered to be an “open system” are proven to be associated with contamination of the drain tract by retrograde spread of skin bacteria. Even suction drain will become plugged with fibrin and pus within a few hours and would serve mostly as a unilateral *autobahn (toward the inside)* for *skin bacteria*(3).

Nevertheless, herniation of the bowel through small incisions in which drains have been placed is rare, as these wounds are small and close spontaneously after the removal of the drains. After removing the drains, the fascial defect and the skin at the drain site are usually not sutured.. This is based on the fact that the musculature of the abdominal wall that underlies the anterior fascia, together with the normal fascial elasticity, will usually prevent any herniation of the bowel through the small fascial defect.(4). When the operated wound becomes infected, these mechanisms are disturbed and the desired strength is not possible.

Given these complications of drain sites, the role of prophylactic or unnecessary drainage has to be avoided and clear guidelines have to be established as to the exact indications.(5).

The history of abdominal drainage is as old as the history of surgery. However, abdominal drainage has always been a subject of controversy, practiced in confusion and subjected to local dogmas. Lately, large meta-analysis have revealed that the indications of prophylactic drains should be minimized in cases of non complicated operations such as laparoscopic or open cholecystectomy, gastric and gynecologic surgery(6,7,8).

On the other hand, there is insufficient evidence showing a clear indication for routine drainage in colorectal surgery(9). Drain site evisceration after abdominal surgery has rarely been reported. Most of the reported cases concern drains with an external diameter of more than 10 mm. Evisceration of the appendix occurred at the site of drain placed in right lower quadrant. Appendix had become adherent to side hole of drain with an external diameter of 11mm.. Small bowel loops and appendix are the most common herniated abdominal viscera through drain sites with subsequent obstruction or strangulation. Gallbladder herniation through a drain site has also been reported(10). Hernias through drain site have occurred 3 to 8 hours after drain removal. Herniation through laparoscopic port sites is uncommon, with an incidence of less than 0.1%.(11). Herniation and incarceration of the small bowel through a drain site situated in a trocar site following a laparoscopic colectomy has been reported(12). A Richter’s hernia can also occur at trocar sites following laparoscopic procedures and can be treated laparoscopically(13). Commonly, drain-site hernias occur several months to several years following a laparotomy. These hernias are mostly associated with incisional hernias of the main laparotomy scar(14).

In our situation, in the first case the herniation started occurring 2 yrs after surgery and in the second case, the herniation occurred 9 yrs after surgery. In both the instances, there was no herniation in the main wound.

It is generally believed that larger the size of a drain, the greater is the risk of drain-site herniation. So, the size of the tube has to be decided by balancing the risk of herniation, with the adequacy...
of peritoneal drainage. Also, laparotomy incisions for contaminated procedures carry a higher risk of developing hernias(15). Whether or not this risk applies to the drain site as well is not drain site hernias can be totally prevented known. Usually, the small size of the But, Drain site hernias once detected should defects does not warrant the use of a mesh.

In both our cases we were not able to get the details about the size of the drains placed and the technique of their drain placement. Regarding the site of drain placement, both our cases presented with somewhat anteriorly placed drains i.e. not the usual site where the drains are placed. In our first case, the previous laparotomy had been done for perforative peritonitis, which is a contaminated procedure with higher risk of hernias. Contaminated procedure and wrong site of placement should have probably contributed to the occurrence of drain site hernias in our cases. To prevent drain-site hernias, some suggestions include:

An oblique insertion of drains such that it pierces the muscle layers at different points

Narrow-bore suction drains should be chosen, whenever possible

Insert purse-string sutures around drains with diameters larger than 10 mm to close the drain site defect.

Using 5-mm port sites for drains during laparoscopic surgeries

Remove drains once they have outlived their tasks

**CONCLUSION:**

Prevention is the best way to manage any complication. So, Insertion of drain like any other step in surgery is to be performed with utmost care and attention. If this practiced, applies to the drain site as well is not drain site hernias can be totally prevented.

**REFERENCES:**


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