

Case Series

Challenging hernias: a case series of atypical hernias and review of literature

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Received: 11 February 2023

Revised: 14 March 2023

Accepted: 16 March 2023

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ABSTRACT

Atypical hernias encompass the categories of flank, lumbar, spigelian, suprapubic and subxiphoid hernias among other rarer variants. These are considered to be tribulation in terms of their diagnosis and management, in that they are in proximity to the bone, which makes defect delineation, adequate mesh overlap, and fixation very challenging. Here, we would like to highlight a selection of our institutional experience with such hernias and their management. Within the institution, 6 cases of such rare hernias repaired within the last 6 months were chosen that posed a therapeutic challenge to the operating team. The cases described are- an interparietal port site incisional hernia, true lumbar hernia, flank region incisional hernia, a traumatic flank hernia, traumatic obstructed interparietal flank hernia, and a traumatic diaphragmatic hernia. All of the above cases were successfully managed by our team by a combination of abdominal wall reconstruction and mesh repair and have not reported any post-operative complications in the follow up period. Literature regarding rare hernia repairs is becoming more exhaustive by the day. However, the likelihood that we encounter such cases in practice is still less. Hence, it is essential to further the knowledge about management of such complex hernias and make an informed decision tailored to the patient's requirements.

Keywords: Hernia, Atypical, Traumatic, Lumbar, Interparietal, Flank, Mesh

INTRODUCTION

Abdominal wall hernias encompass a variety of clinical entities ranging from the more common umbilical and epigastric hernias, to midline incisional hernias, and progressing to the rarer variants such as flank hernias and interparietal hernias. These connotated "rare" variants can be coupled together under the banner of atypical hernias. Atypical hernias may include subxiphoid, suprapubic, interparietal and spigelian, flank and lumbar hernias, these being either primary, or incisional.¹ These hernias are so rare such that proper management guidelines could not be elucidated for the same. Interparietal hernias boast an incidence of 0.1-1.6%, being a rare complication of surgical incisions. Incidence of incisional hernias in the flank region is 17%, with management being polarized as per the case. True lumbar hernias account for 2% of all

abdominal wall hernias. Traumatic abdominal wall hernias are an exceedingly rare clinical occurrence with an incidence of 0.2% following blunt trauma to the abdomen. Traumatic diaphragmatic hernias are uncommon and lethal entities. In this article, we attempt to bring to light 6 cases that fit into the above-mentioned categories that were managed by our team. The goal of this analysis is to outline the ways in which such hernias present and how best to proceed with evaluating and managing them.

CASE SERIES

This is a retrospective analysis of data collected from our institute between the time period of 2019-2022. Among all hernia surgeries that were performed during this time frame, we have chosen to highlight 6 cases that presented us with a challenging situation. The cases are as follows -

a case of an interparietal hernia following a laparoscopic ovarian cystectomy, a case of a true Grynfeltt hernia, a case of an incisional flank hernia following a ureteric

reimplantation, a traumatic flank hernia, the eponymous “motorbike handlebar hernia”, a traumatic Spigelian hernia, and finally, a traumatic diaphragmatic hernia.

Table 1: Hernia types.

Type of hernia	Age	Sex	Previous surgeries	Management	EHS class
Interparietal incisional port site hernia	43	F	Cesarean section, ower midline incisional hernia mesh repair, laparoscopic ovarian cystectomy	Onlay mesh repair	L2
Grynfeltt hernia	63	M	Lipoma excision	Sublay mesh repair	L4
Flank incisional hernia	55	F	Ureteric reimplantation	Onlay mesh repair	L2
Traumatic flank hernia	34	F	Puerperal sterilization	Sublay mesh repair	L2
Traumatic obstructed interparietal flank hernia	50	F	None	Anatomical repair	L2
Traumatic diaphragmatic hernia	55	F	None	Rent closure	N/A

The above cases were all managed surgically by the same team after proper pre-operative evaluation and preparation. Out of the above, 4 were managed in an elective setting, while 2 were managed as emergencies. 3 of the above developed post-operative complications in the form of wound infection (1), flap necrosis (1) and respiratory compromise (1). All of the above complications were successfully managed and mitigated during the hospital stay and all of the above patients were discharged in health. Follow up was done every 2 weeks for a month, every month for 3 months and 6 monthly thereafter, with no further complaints noted by any of the patients during the follow up period. We would like to elucidate the presentation and management undertaken for these cases in short segments for better understanding.

Case 1

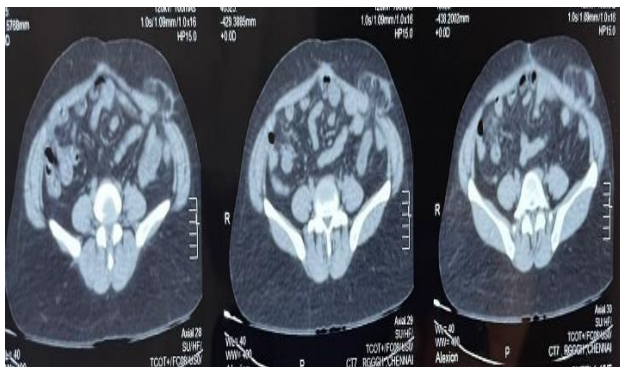


Figure 1: CT images showing subcutaneous sac.

A 43-year-old female presented with complaints of a swelling in the left lower abdomen since 3 months, that was reducible but painful. She had undergone a laparoscopic surgery for removal of a left sided benign ovarian serous cystadenoma 1 year prior, with the present swelling arising from the site of one of the working ports inserted in the left lumbar region. She had previously undergone an onlay mesh repair for an incisional hernia at

the lower midline scar site of a solitary caesarean section. Computed tomography (CT) abdomen showed a 1.5×1.5 cm defect in the left spigelian fascia with herniation of omental fat and associated fat stranding, the sac of 5.8×2.5×6.1 cm lying completely in the subcutaneous plane. Intraoperatively, an interparietal hernia with a defect of 3×3 cm was noted at the previous left lumbar port site with herniation of omentum, along with the intact mesh of the previous surgery. Onlay mesh repair was undertaken after closure of the defect and flap creation.

Case 2

A 63-year-old male came with a swelling in the left flank region since 6 months. He had given history of having undergone an excision biopsy at that very location 1 year previously, following which the swelling had not reduced, but increased in size. Examination revealed a solitary, soft, non-tender, hemispherical swelling of 4 cm diameter in the left lower back, just below the 12th rib, with an overlying transverse scar. The swelling was reducible.



Figure 2: Hernia with overlying scar.

Ultrasonography (USG) and CT abdomen were undertaken, which showed the possibility of a left sided lumbar hernia, with herniation of perinephric fat through

the superior lumbar triangle. Through a posterolateral incision, a sublay repair was done.



Figure 3: Mesh placed as sublay.

Case 3

A 55-year-old female presented to us with complaints of a progressively increasing reducible swelling in the right flank. The patient had undergone right sided open ureteric reimplantation 1 year prior to present day for refractory hydroureteronephrosis. The surgery was uneventful and the patient did not have any urological complaints at present. On examination, a 5×6 cm ovoid swelling was noted in the right flank, at the region of the scar of the previous surgery. CT abdomen was undertaken, which revealed a defect of 5.2×3.4×5.5 cm in the right anterolateral abdominal wall with herniation of bowel and omentum. Open surgery was undertaken through the previous incision, with the defect noted at the summit of the previous incision. All layers of abdominal wall musculature were delineated and approximated separately followed by an onlay mesh repair.

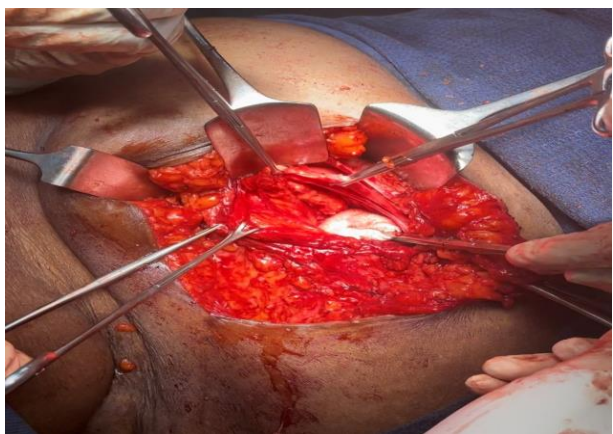


Figure 4: Demonstration of defect.

Case 4

A 34-year-old female came to us with a swelling of 3-years duration in the left lower abdomen. She had been involved

in a motorcycle accident with handlebar impact to the abdomen 3 years in the past, with the gradual development of a swelling at the site of the abdominal impact. A swelling of 25×25×5 cm was noted on examination occupying the left iliac fossa, medially until the umbilicus, laterally until the anterior superior iliac spine, and inferiorly until the inguinal ligament. The swelling was reducible, with prominence on coughing or straining. CT abdomen was done, which showed a hernial defect of 4.5×5.8 cm in the left lower abdominal wall, with the sac measuring 12.5×7.9×5.2 cm containing bowel and omentum. The lateral edge of the defect was in close proximity to the iliac bone.



Figure 5: CT showing huge defect close to iliac bone.



Figure 6: Pre-peritoneal mesh placement.

Open approach was utilized, with fashioning of a preperitoneal layer that was approximated and the mesh placed over the above layer and anchored with transfascial sutures.

Case 5

A 50-year-old female presented to the emergency department with history of being involved in a road traffic accident as a driver of a 2-wheeler 5 days prior to presentation. Following the incident, she sustained a small laceration in the left iliac fossa and developed a swelling at that site that became painful on the 4th day post-trauma. On examination, she was found to have tachycardia, with a tender swelling of 4×3 cm in the left lumbar region that

was irreducible with an overlying laceration of 1×1×1 cm. She also had hyperdynamic bowel sounds. An emergency CT of the abdomen was undertaken with contrast that revealed a defect of 2 cm in the abdominal wall of the left iliac region with herniation of bowel in the interparietal plane that was obstructed, a possible left traumatic obstructed spigelian hernia.

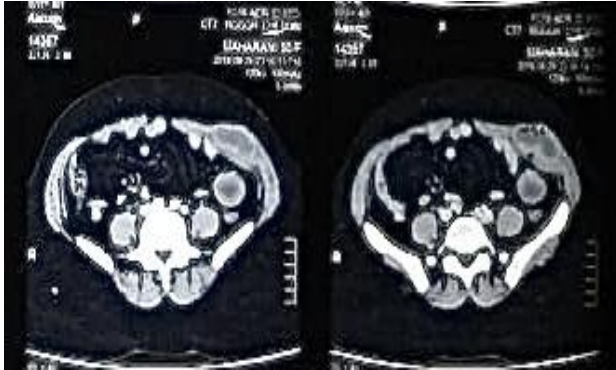


Figure 7: CT showing right lateral wall hernia.



Figure 8: Bowel loop found in interparietal plane.

She was taken up for emergency surgery through an open approach over the swelling. The sac was opened, which revealed dusky, but healthy bowel. The defect was traced out. The bowel was placed back in the peritoneal cavity and anatomical repair of the defect was done.

Case 6

A 55-year-old female was received in the emergency department following an accident involving herself as a pedestrian and an oncoming motorcycle, following which she developed left sided chest pain and breathlessness, with left shoulder and lower limb pain as well. Upon examination, there were reduced breath sounds noted in the left hemithorax, with the surprising presence of bowel sounds. After stabilization, she was shifted for CT imaging of the thorax and the abdomen, wherein herniation of stomach, transverse colon, and omentum was noted into the left hemithorax. She was taken up for emergency surgery with the diagnosis of a traumatic diaphragmatic hernia. A midline laparotomy approach was chosen, with the above- mentioned contents reduced back into the

abdomen after they were observed to be healthy. A diaphragmatic rent of 10×5.5 cm was noted, with the medial edge in close proximity to the pericardial pad of fat. Primary repair of the rent was done with polypropylene, with placement of a thoracic and intraabdominal drain.

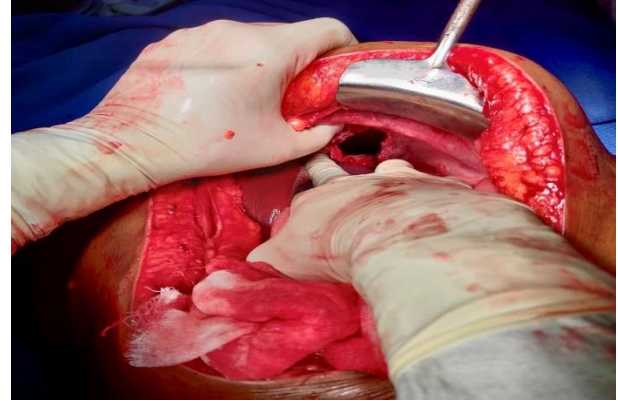


Figure 9: Diaphragmatic rent.

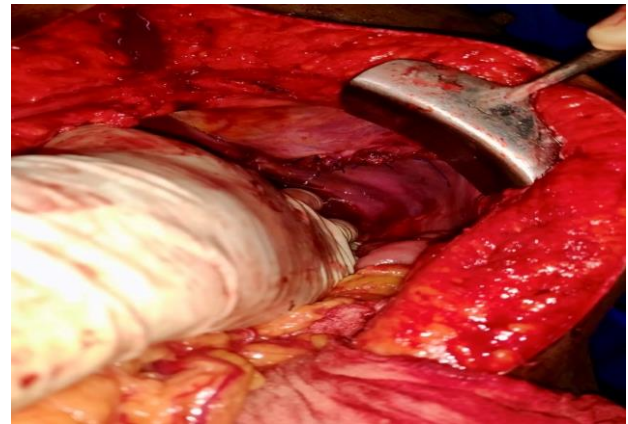


Figure 10: Suture repair of the rent.

DISCUSSION

Hernias serve as the bread and butter for any general surgeon. Inguinal hernia repairs are practiced by all, ranging from a surgical resident to a superspecialist. However, hernias themselves are not uncomplicated and innocuous in all cases. There have been more and more reports of hernias occurring in previous incisions multiple times, hernias with complex histories, in odd locations, all of which pose a mighty challenge in terms of providing the optimal repair that will render the patient free of hernias for the longest possible duration.

Above, we have described an institutional experience by a single team of surgeons in handling such unusual hernias. We would like to tackle this topic by discussing and brainstorming each of these categories of hernias described.

Interparietal hernias are rare occurrences where there is protrusion of the intra-abdominal contents through the

layers of the abdominal wall. An interparietal hernia is a very unusual complication of a surgical incision, with factors such as emergency surgery, bowel resection, poor suturing and closure techniques acting as possible predisposing factors.² There are three subtypes of interparietal hernias, those being superficial (between EOA and skin), interstitial (between the transversalis fascia and the transversus abdominis, internal oblique or external oblique), and preperitoneal (between the peritoneum and the transversalis fascia). A hernia arising through a laparoscopic port site is in itself rare, with an incidence of 0.5-2%, out of which the chances of these hernias being of interparietal variety are very slim.³ The maximum incidence of herniation is noted with 10 mm supra/infraumbilical ports, with lateral ports having lesser incidence of serving as defects. The present mandate is to manage these hernias laparoscopically with a preperitoneal repair.⁴ However, an onlay mesh through open technique was undertaken successfully in our patient. She developed minimal flap necrosis post-operatively which was managed with a combination of debridement and dressing. She is currently doing well and without recurrence.

True lumbar hernias can arise in two areas of weakness- the superior triangle of Grynfeltt (bound by the 12th rib, erector spinae, and internal oblique) and the inferior triangle of Petit (bound by the iliac crest, latissimus dorsi, and the external oblique). Hernias through the Grynfeltt triangle are much more common than the Petit triangle due to its larger size. These Grynfeltt hernias can be oft times difficult to pick up if smaller in size due to the bulk of the latissimus muscle that overlies the triangle. It is this location underneath the muscle that leads to the diagnostic confusion of these hernias with other soft tissue swellings, as the typical reducibility and cough impulse may be impeded.⁵ In our case, this hernia was previously mistaken to be a lipoma, with a small portion of its content excised, assuming that to be an "entire lipoma". This elucidates the importance of radiology in picking up these masqueraders. These can be repaired satisfactorily through open or laparoscopic approaches. Sublay mesh placement is ideal in primary lumbar hernias and was hence undertaken in our case.

On the other hand, in acquired hernias of the lumbar region, muscle flaps might be mandates above the mesh to ensure complete coverage of the defect. Hernia rates of 0.4-17% have been reported following flank incisions. The risk factors for the development of the same include high body mass index (BMI), inability to identify and preserve the neurovascular bundles, post-operative wound infection, abdominal distention, single layer closure and old age. It is always better to preoperatively assess such patients with a CT of the abdomen, which will provide information regarding the shape and size of the defect, anatomy of the abdominal wall musculature and contents of the sac. Due to the general proximity of these hernias to bony landmarks and retroperitoneal structures, their repair becomes technically difficult. In 2016, Lanier et al

commented that the ultimate tensile strength of the repair should be greater than the natural muscular forces to reduce the tension at the suture-tissue interface. There is no dictum for the management for flank incisional hernias per se, but an armamentarium of options exist, ranging from simple suturing, to mesh repair with polypropylene mesh with or without component separation, to laparoscopic composite mesh.⁶ An onlay mesh repair was feasible in our patient after suturing of the individual muscles of the abdominal wall and was hence undertaken without any complications.

Traumatic abdominal wall hernias are entities that are defined as protrusions through disrupted muscles and fascia as a result of considerable trauma, in the absence of hernia at that site prior to injury. The only known classification of these hernias was provided by Wood et al, who grouped these into three basic types: type 1- herniation through small defects, type 2- herniation through larger defects caused by high energy trauma, and type 3- intra-abdominal bowel herniation due to deceleration injuries. In our first case, a trauma sustained as a result of a motorbike handlebar (blunt force) caused transmission of energy through the skin without penetrating it, and the translation of this energy through the layers of the abdominal wall, causing focal disruption that worsened over time. There have been only 37 cases of handlebar hernia reported in literature.⁷ Usually, these present more acutely with tender swellings. Our patient developed the swelling very gradually and was not typically symptomatic. The swelling was consistently enlarging with time, which can be attributed to the hypothesis that unbalanced forces acting on the defect in the lateral abdominal wall kept enlarging the defect with time.

In contrast, the second case we describe is one that was identified acutely and was hence managed as an emergency procedure. The patient was opined radiologically to have an obstructed loop of bowel, which was found to be interparietal in location, which is a rare incidence. Since most of these hernias present more acutely, prompt surgical intervention is the norm. However, even if identified at a delayed time, it is mandatory to undertake repair of such hernias. The controversy in management of traumatic abdominal wall hernias revolves around two questions: "is mandatory exploration required at diagnosis?", "what is the best surgical approach- to mesh or not mesh?".⁸ If patients present acutely and an accurate diagnosis is made, it is best to explore emergently after concurrently examining for concomitant intra-abdominal injuries, through either a midline laparotomy approach (if other intra-abdominal injuries are noted) or a hernial defect location- based approach. With regards to the use of mesh, the choice depends upon the degree of contamination (and thus, further risk of mesh infection) noted during the surgery. For small defects, primary closure might suffice, with the risk of recurrence close to 30%.⁹ Bioabsorbable meshes can be utilized in the acute contaminated setting with

confidence. Alternatively, the repair can altogether be delayed by 6-8 weeks to allow for tissue edema to settle and perform a tension free mesh repair.

Traumatic diaphragmatic hernias arise in 3% of all abdominal injuries, with preponderance towards the penetrating mode of injury.¹⁰ These tend to occur as a result of sudden increase in the pleuroperitoneal pressure gradient, causing rupture of the diaphragm at a site of embryological weakness, leading to herniation of intra-abdominal contents into the thoracic cavity and high risk of strangulation. They may clinically present with breathlessness of acute onset and reduced breath sounds on the affected side. These are not usually picked up on radiological evaluation unless there is associated herniation. Therefore, there must be high index of suspicion to diagnose such patients. An upright chest x-ray may demonstrate elevation of the hemidiaphragm with bowel gas noted in the chest, and similar findings may be noted on CT imaging as well. When associated with trauma, these should always be managed with laparotomy to rule out concomitant abdominal injuries as well as assess the health of the herniated contents. Closure of the diaphragmatic rent depends upon the size; smaller defects may be closed primarily with prolene, while larger defects may require the interposition of a mesh.

CONCLUSION

All hernias cannot be considered simple and uncomplicated. This analysis is an attempt to highlight the more uncommon presentations of hernias, which often do not boast of much literature in terms of their evaluation and management. The knowledge and skills to repair such hernias do not usually fall into the armamentarium of a general surgeon, and only more outreach of repair of such cases will correct that.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Shanthi PS, Kawarat VC, Shankar A. Challenging hernias: a case series of atypical hernias and review of literature. *Int Surg J* 2023;10:678-83.