

## Right Subcostal Incisional Hernia: A Surgical Challenge

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### ABSTRACT

*Subcostal incisional hernia invariably poses a surgical challenge due to the variability in its anatomical contents. Preoperative contrast enhanced CT scan of the abdomen provides an excellent road map for ascertaining the contents and planning a safe repair. Open mesh repair is the safest option for subcostal incisional hernias with multiple adherent contents*

**Key words:** *subcostal, incisional, hernia, mesh, open, laparoscopic repair Right Subcostal Incisional Hernia: A Surgical Challenge.*

### INTRODUCTION

Incisional hernia is one of the most morbid complications of abdominal surgery. The site of incisional hernia determines the morbidity in majority of cases. A right subcostal approach is most commonly utilized in majority of hepatobiliary procedures and is associated with high morbidity in the event of an incisional hernia developing. A series of two cases of right

subcostal incisional hernia presenting with morbid complications posing a surgical challenge by virtue of adherent contents of the sac is presented.

### CASE REPORT 1

A 60 year old lady presented with symptoms of intestinal obstruction. She was a known diabetic and had undergone open cholecystectomy 4 yrs. back. She gave history of infection of wound

which was treated conservatively. Two years after the surgery she developed a swelling adjacent to the scar. She also gave history of intermittent attacks of abdominal pain, vomiting and distension of abdomen. She used to take treatment from a local hospital for the same. Seven days prior to admission she had the same symptoms which didn't respond to conservative treatment as a result of which she was referred to our unit.

On examination the vital parameters were within normal limits. Physical examination of the abdomen revealed a swelling adjacent to right subcostal scar, (Figure 1) There was no rebound tenderness, guarding or rigidity. Abdominal X-ray showed multiple air fluid levels. She was given a trial of conservative treatment to which she responded well. Following this a contrast enhanced CT scan of abdomen (CECT) was done which revealed a defect in the right hypochondrium. Patient underwent open surgery for the repair of incisional hernia. The sac was identified, dissected upto the neck and opened there after. A large segment of colon was adherent to and lying within the sac. (Figure 2) The adherent omentum along with colon was dissected carefully and repositioned into abdomen. The surrounding musculoaponeurotic structures were identified. An attempt was made to separate the anatomical components. However due to extensive adhesions and attenuation of local anatomical structures it was difficult to perform component separation. As a result a polypropylene mesh was placed over the sac and fixed all around to the musculoaponeurotic structures. (Figure 3) A negative suction tube drain was placed over the

mesh and brought out through a separate incision. Drain was removed on 4<sup>th</sup> Post-operative day and sutures removed on 12<sup>th</sup> post-operative day. Post-operative recovery was uneventful with no recurrence till date.

## CASE REPORT 2

A 59 year old gentleman, a known diabetic presented with a large incisional hernia following an open cholecystectomy performed 3 yrs. ago. Patient did not give any history suggestive of any obstruction. Physical examination revealed a large incisional hernia in the right subcostal region which was partially irreducible. (Figure 4) Contrast enhanced CT scan of the abdomen showed a defect in the parietal wall at the previous surgical site with the liver, stomach and colon as the contents. (Figure 5) Patient underwent open repair. The sac was identified, dissected upto the neck and opened. Contents of the sac were stomach and liver medially and the colon along with omentum laterally. (Figure 6) The contents were dissected and repositioned back into the peritoneal cavity. Component separation was not feasible due to attenuation of surrounding musculoaponeurotic structures. Double breasting of musculoaponeurotic structures was done with non-absorbable suture material. (Figure 7) This was followed by placement of polypropylene mesh as an only. A negative suction drain was kept over the mesh and brought out through separate incision. Drain was removed on 4<sup>th</sup> post-operative day and sutures removed on 12<sup>th</sup> post-operative day. Post op recovery was uneventful with no recurrence till date.

## DISCUSSION

Right upper quadrant of the anterior abdominal wall is an anatomical transition zone. As a result it exhibits a great anatomical variation with respect to the muscles and aponeurosis. [1] Accurate identification of anatomical structures while making an incision is of utmost importance. The structures which have been incised therefore have to be approximated layer wise with suitable suture materials in order to ensure good and sound healing. Mass closure of a right subcostal incision invariably leads to overlooking of individual muscle layers. As a result the approximation is suboptimal thereby predisposing to the development of an incisional hernia. Once an incisional hernia develops there is tendency for it to grow rapidly due to various reasons. The parietal wall muscles attached to the costal margin are in the form of sheets. They rapidly contract in size and become attenuated. This becomes a significant stumbling block for anatomical approximation at the time of repair of an incisional hernia. With contraction of the superior portion of muscle the distance of the muscular edge from the costal margin is reduced significantly thereby making component separation of this part an exercise in futility. Due to the dynamic forces acting on the lower edge of defect, the defect enlarges eventually leading to loss of domain. Once there is loss of domain the local solid and hollow visceral organs find their way into the sac. The transverse colon by virtue of its distended state alongwith the overlying omentum always is the content of the right subcostal incision hernia sac. As the size of the

defect increases with time other adjacent organs also enter the sac. Amongst the solid organs the lower margin of liver becomes a content of sac and develops dense adhesions to the upper portion of neck of the sac. Usually it happens to be the left lobe of liver followed by the stomach becoming a content of the sac. These anatomical and pathological considerations therefore pose a great challenge to the surgeon. [2] Thus a preoperative contrast enhanced CT scan of the abdomen provides an excellent road map for judging and deciding the surgical approach to the patient with regards to the technique.

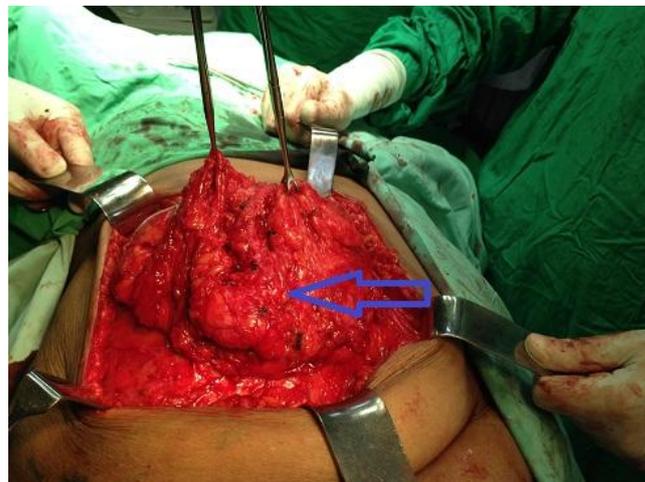
Laparoscopic approach can be utilized in smaller hernia sacs wherein the contents are fully reducible. [3] However if the contents are irreducible then an open approach is the safest option. An open approach enables proper dissection of sac upto the neck before opening it. This ensures complete delineation of neck of sac. Once the sac is opened the adherent contents can safely be released and repositioned back in the peritoneal cavity. A herniotomy should be performed with excision of redundant sac.

Component separation in longstanding subcostal hernias may not always be feasible. This is because of significant contraction and attenuation of the surrounding muscles. Any heroic attempt to do so will further weaken the fused muscle edges thereby rendering fixation of a mesh inadequate. In such cases it would be a good practice to approximate the musculoaponeurotic edges as they are with a non-absorbable suture material followed by placement of an onlay mesh. The mesh should be fixed securely all around to the

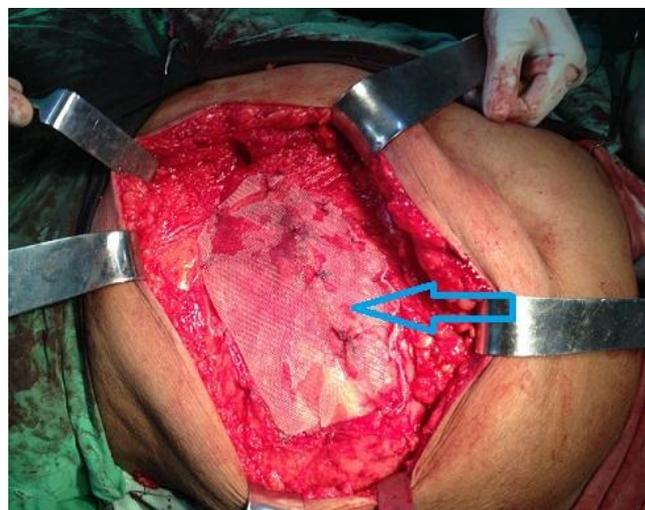
underlying musculoaponeurotic structures. [4, 5] A negative suction drain is mandatory as it reduces the incidence of seromas around the mesh. Seromas are common accompaniments in onlay meshplasty techniques. Seromas are caused by a combination of irritation due to the mesh and liquefaction of subcutaneous fat. A negative suction tube drain not only prevents seromas but also helps in obliteration of the dead space thereby increasing the adherence of adjacent tissue surfaces to the mesh. The drain should be removed only after the drainage stops. The traditional fear of infection due to negative suction tube drain is a misconceived notion. In both the cases presented, as well as for all other incisional hernias we have had no infection after incisional hernia repair despite using a negative suction tube drain in all cases. [5, 6]



**Figure 1** Right subcostal incisional hernia marked with the red arrow



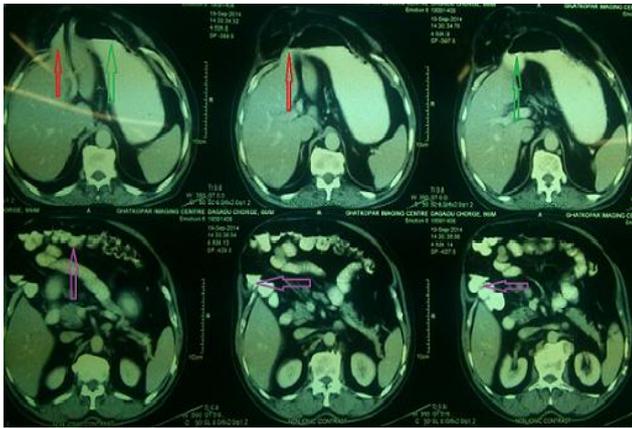
**Figure 2** The opened sac containing a segment of the adherent transverse colon marked by the purple arrow



**Figure 3** Onlay polypropylene mesh fixed with non absorbable sutures



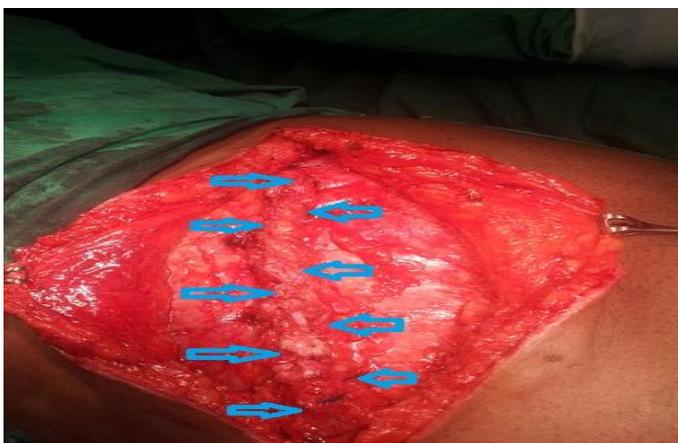
**Figure 4** Irreducible right subcostal incisional hernia marked by the black circle.



**Figure 5** Contrast enhanced CT scan of the abdomen showing the defect in the parietal wall with liver (red arrow), stomach (green arrow) and colon (pink arrow) as the contents of the sac.



**Figure 6** Contents of the opened sac were liver (green arrow), stomach (blue arrow) and the colon (brown arrow).



**Figure 7** Double breasted muscle layers marked by the blue arrows.

## CONCLUSION

Right subcostal incisional hernia is one of the most challenging and intricate hernia. Preoperative contrast enhanced CT scan of the abdomen is essential for ascertaining the content of the sac. If the contents are multiple and adherent then open mesh repair is the mainstay of treatment.

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