Robotic Assisted Repair of Traumatic Ventral & Diaphragmatic Hernias: A Case Report

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Background

- Traumatic abdominal wall hernias (TAWH) have a reported incidence of <1%, and when caused by handlebar-like objects are referred to as handlebar hernias [1-2].
- Traumatic diaphragm hernias (TDH) are also an extremely rare event and are easily missed on initial presentation, as patients are often asymptomatic, and the defect is difficult to detect on imaging [3].
- Once identified, both require immediate surgical intervention due to the high mortality rate associated with incarcerated and strangulated tissue [4-5].
- **We present a case of a 72-year-old female who sustained a TAWH and TDH from the handlebar of her electric bicycle, who underwent robotic assisted repair with primary closure and OVITEX mesh placement and had no post-operative complications.**

Case Presentation

- A 72-year-old female with a past medical history of left lung lobectomy 6 years ago presented to the emergency department complaining of abdominal pain after suffering a handlebar injury while riding an electric bicycle.
- On presentation, she was hypotensive but responded rapidly to fluid resuscitation. A large ecchymosis was seen on her right flank, but there were no signs of abdominal herniation upon further examination.
- Only a grade 2 liver laceration with adjacent area of hemorrhage was identified on imaging studies, so no surgical intervention was planned, and the patient was held for overnight observation.
- Repeat imaging the following day revealed a right ventral wall defect, and so the patient was prepped for immediate surgical intervention and repair.
- Under direct visualization, an 8cm defect containing herniated fat was seen along the anterior superior abdominal wall with extension on the diaphragm. No other traumatic pathology was identified.
- The herniated fat was reduced, and the defect was closed with a primary repair followed by placement of OVITEX mesh (Fig 1).
- The patient tolerated the procedure well and was discharged on post-op day two with no complications.

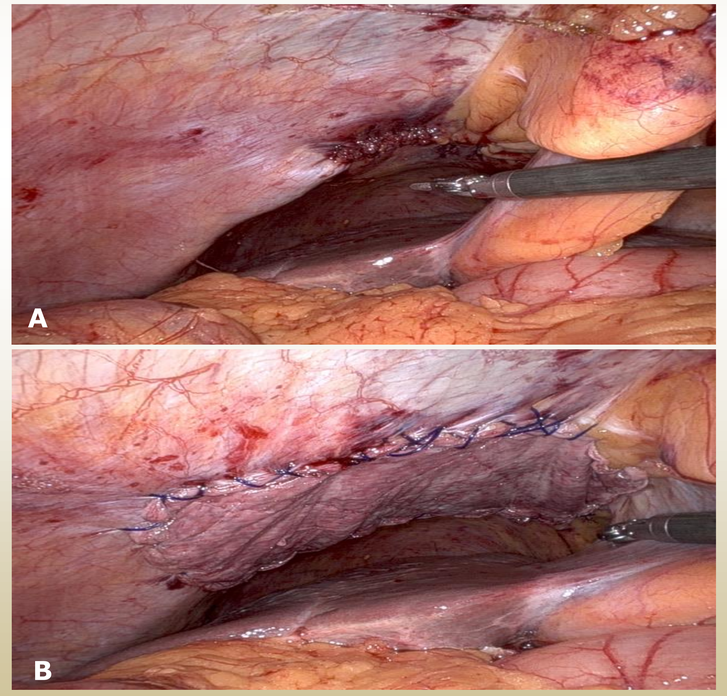


Figure 1: Robotic-assisted repair of TAWH and TDR using running v-lock 1-0 suture for the primary repair (A) followed by placement of 6x10cm OVITEX mesh for reinforcement (B).

Discussion

- Handlebar hernias are rarely associated with other intra-abdominal injuries and have only been described in concurrence with TDH in less than 5 cases.
- No evidenced based protocols exist regarding the surgical management of TAWH or TDH, leaving the approach and repair technique largely up to the comfort and skill set of the surgeon.
- Laparotomy and thoracotomy are the standard surgical approaches in the setting of instability and polytrauma, however, they may not be necessary in hemodynamically stable patients who require minimal intervention.
- Minimally invasive techniques provide diagnostic and therapeutic solutions while reducing post-operative pain, wound complications, and improved recovery times compared to open procedures.
- Our patient was stable with no other obvious abdominothoracic injuries, so a robotic approach was planned due to the location of the TAWH. When the TDH was identified, biologic mesh was used to reinforce the primary repair, as it allows for native tissue to remodel and strengthen the repair over time.

Conclusion

- In the setting of blunt force trauma, a high degree of suspicion must be maintained for TAWH and TDH, as a delayed diagnosis results in an increased mortality rate due to long term complications.
- Robotic assisted repair of these defects is feasible and effective in hemodynamically stable patients to reduce the post-operative complications associated with open procedures.

References

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