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# Hybrid Approach for Post Traumatic Anterior Abdominal Wall (Lumbar Region) Hernia: A Review of the Case

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**Abstract:** ***With incidence rate of 0.9~1.5% among blunt trauma, post traumatic abdominal wall hernia is rare entity. Causes includes sudden increase of intra-abdominal pressure and extensive shearing force applied to the abdominal wall. Since complexity of ventral hernias being operated on has increased, the treatment strategy has also evolved to obtain optimal results. In the intraperitoneal onlay mesh repair (IPOM) method of abdominal wall hernia repair, mesh is placed over the abdominal wall defect and secured from inside the peritoneal cavity. In the IPOM plus method, in addition to IPOM, the hernia orifice is also closed by direct suturing, a procedure that is anticipated to reduce the recurrence rate. Laparoscopic surgery in patient with large gap defect having difficulty in closure during ipom with undue tension hybrid technique was used incorporating open laporotomy approach along with laparoscopic reconstruction. Hybrid ventral hernia repair is a promising technique in management of complex ventral hernias. Hybrid ventral hernia repair represents a natural evolution in advancement of hernia repair. use of hybrid repair in selected patients combines the safety of open surgery has several advantages of the laparoscopic approach with favourable surgical outcomes in terms of recurrence, seroma and incidence of chronic pain.***

**Keywords:** post traumatic lumber region hernia, post traumatic hernia, Hybrid intraperitoneal onlay mesh repair (IPOM) plus, Complex ventral hernia, hybrid technique

## 1. Introduction

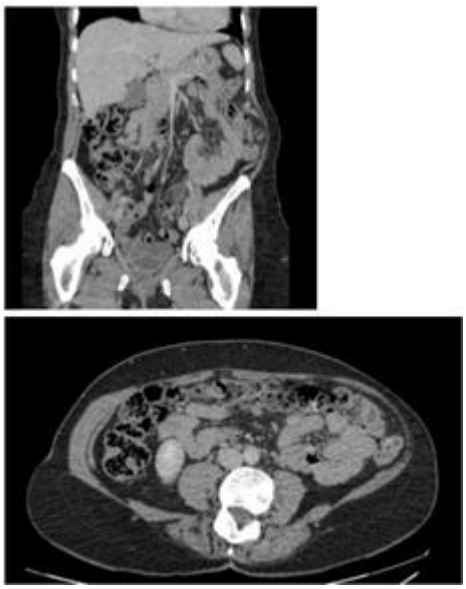
There are several laparoscopic techniques for repair of abdominal wall hernias. Laparoscopic intraperitoneal onlay mesh (IPOM) repair was accepted due to the advantages of decreased post-operative morbidity (mainly wound related) compared to the open approach. [1, 2] However, some common sequelae associated with laparoscopic IPOM include seroma formation, bulging and failure to restore abdominal wall function. [3, 4] In an effort to improve outcomes, laparoscopic IPOM in combination with defect closure (laparoscopic IPOM plus) was suggested for the management of ventral incisional hernias. Several authors have reported improved surgical outcomes. [5]

As more and more complex ventral hernias are being operated on, the treatment strategy has also evolved. Complex traumatic or incisional hernias include hernias with large defects, dense adhesions requiring extensive adhesiolysis, previously implanted mesh and redundant abdominal wall skin and tissue requiring excision. These can be difficult to manage entirely laparoscopically due to increased risk of intraoperative complications, especially enterotomies. Hybrid approach, combining open and laparoscopic techniques, confers the advantages of both techniques. It has been suggested that hybrid approach is a feasible and safe approach for difficult post-operative ventral hernia. [6] It has been shown to reduce patient morbidity due to targeted skin incision and at the same time retaining several advantages of minimal access approach, namely laparoscopic evaluation of the entire abdominal wall with the placement of large intraperitoneal prosthesis. [7] Early conversion to the combined technique is associated with less technical difficulty, decreased operative time, lower enterotomy rates, shorter hospital stay and improved patient outcomes. Due to the rarity of this type of hernia, diagnosis and management of this hernia always pose a challenge to the attending surgeon.

We report herein our use of the hybrid IPOM plus method combining open and laparoscopic surgery to safely treat post traumatic left anterior wall (lumbar region) hernia.

## 2. Case Study

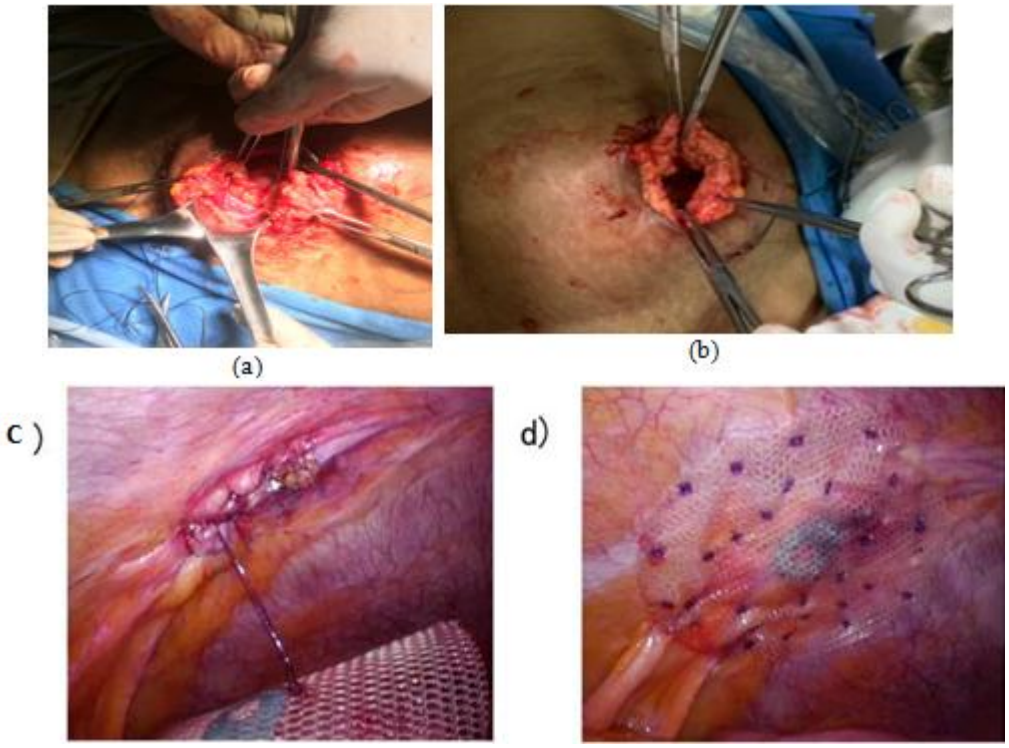
A 55-year-old female presented with a swelling in the left lumbar region since two months following history of trauma. There was no history of any undue straining or any medical comorbidities. Physical examination revealed a bulge arising from left lumber region measuring approx 15×15 cm2 . The bulge disappeared on lying down and became obvious on standing and coughing, becomes more prominent on straight leg raise test. Both a visible and palpable impulse on coughing were appreciated. A contrast enhanced CT scan was done and revealed a Defect in anterior abdominal wall in left lumbar region and left iliac fossa with herniation of omental fat and small bowel loops through the defect. The wall defect measures 65 mm (CC) and 67 mm (TR). The lower end of hernia is approx 36 mm above iliac crest. No evidence of dilatation of bowel loops found on imaging.



CT Scan Performed Pre-Operative Showing Left Lumbar Hernia

Since content was bowel loops and omentum, If bowel resection is required, the hernia orifice can be closed by simple suturing alone, whereas when bowel resection is unnecessary, the IPOM plus method using a mesh is chosen to reduce the risk of recurrence. In this case, we therefore adopted a strategy of using a hybrid IPOM plus method combining open and laparoscopic surgery.

Surgery was performed under general anesthesia by tracheal intubation without concurrent use of epidural anesthesia. A 8-cm skin incision made in left lumber region to expose the hernia sac, which was mobilized. The hernia contents comprised greater omentum and small intestine. The greater omentum reduced to the peritoneal cavity. No perforations or necrotic changes to the small intestine were identified, and bowel resection was judged unnecessary. Reduction to the peritoneal cavity was therefore performed. . After hernia sac reduction, the long diameter of the hernia orifice was measured (6 cm). Using a laparoscopic system a 10 mm videoscope was inserted via supraumbilical site under insufflation pressure of 10 mmHg, and 5-mm trocars were inserted at two sites, under the left costal arch and on the left infra umbilical region. The insufflation was released, and the mesh was inserted into the peritoneal cavity. The mesh used was a 15×15cm2 polypropylene mesh (parietex, Covidien). The hernia orifice was closed by simple interrupted sutures with VICRYL. insufflation was again performed, and supporting sutures were placed on the cranial and caudal sides of the mesh using ethilon 2-0 to temporarily secure the orifice by pulling it up against the abdominal wall. This mesh was further secured by the double-crown method using an AbsorbaTack™ (Covidien). The lumber incision and laproscopic incision site wound were closed by ethilon 2-0 interrupted sutures. post operative period was uneventful. sips followed by liquid diet started on post op day one. Full diet started on post operative day two, later patient discharged on post operative day three.




(a) Closure of the hernia orifice with simple interrupted sutures. (b) The hernia orifice after suture closure observed from inside the peritonealcavity. (c)Temporary securing of the mesh. (d) Securing the mesh using the double-crown method

## 3. Discussion

Traumatic Abdominal Wall Hernia (TAWH) has incidence rate of 0.9~1.5% among blunt trauma. Causes of TAWH are sudden increase of intra-abdominal pressure and extensive shearing force applied to the abdominal wall. Typical location of this hernia is at anatomic weak areas in the lower abdomen. This patient findings consisted with typical traumatic hernia. In this case, the muscle disruption at iliac crest means traumatic origin. Usually the external oblique

muscle is intact, so it is very difficult to palpate hernia defect.

We can classify TAWH injury in two groups-Low energy trauma and High energy trauma. Trauma by bicycle handlebar is one type of low energy trauma. Low energy trauma occurs with impaction on a small blunt object. Typical example of high energy trauma is automobile collision. It disrupts muscle and fascia with intact skin. Usually this trauma accompanies internal organ injury. Approx 1.5% of blunt trauma patients had risk for delayed herniation. Diagnosis of this type of hernia is not easy. CT is the most useful and accurate diagnostic tool. On physical examination, we can find palpable mass at only 30% of patients. Patients with injuries involving all layers of the abdominal wall large defect, hematoma, free intraperitoneal fluid must be treated with immediate laparotomy. Sixty six percent of TAWH patients were treated with immediate operation. After a period of conservative management.24% of patient were underwent operation. And conservative treatment was done for 10% of patients. Sometimes, delayed reconstruction for hernia was done. The advantages of this management are minimization of the risk of surgical site infection. minimization of the risk of subsequent failure of repair, better definition of the edge of the defect, and easy reduction of the hernia. Usual manner of hernia repair is primary closure with absorbable or non-absorbable suture material. Use of mesh can decrease recurrence of hernia. When there is no evidence of abdominal organ perforation clinically and radiologically and no contamination of skin, we can use mesh for correction of hernia.

Since the introduction of the laparoscopic approach by LeBlanc and Booth in 1993, minimal access technique has gained widespread popularity, primarily because of its advantages of less morbidity, short hospital stay, early return to activities and ability to identify additional or occult defects in the abdominal wall. [13]] Despite the advantages of laparoscopic approach, post-operative morbidity has been reported in 3%–18% of cases. [14, 15] The recurrence rates in laparoscopic IPOM, contrary to expectations, still range between 4.4% and 29%, almost at par with the open technique. [11, 16, 17] This was partly due to the widespread application of the laparoscopic IPOM technique to all ventral hernias, irrespective of its complexity and the understanding of the disease process. In review, recurrence rates after the hybrid technique of incisional hernia repair ranged from 0 to 6.3%, which is less than what most literature has reported for open techniques of repair and comparable to laparoscopic IPOM and IPOM plus for the repair of ventral incisional hernias. [5, 12]

Seroma formation is a common complication after ventral hernia repair. In open onlay repair, the seroma rate has been reported to range between 38.5% and 45.6%. Seroma rates for standard IPOM have been reported to range from 0.5% to 78%. In IPOM plus, seroma rates have been reported to range from 0% to 11.43%. Seroma formation in hybrid ranged from 0% to 14.3%, with a mean of 5.47%, which is lower than open onlay repair and standard IPOM technique and comparable to IPOM plus. [8, 9]

Wound infection rates have been reported to be 16.9% for open onlay repair, 31.3% for open inlay repair and 3.7% for open sublay repair. Wound infection rates in standard IPOM have been reported to range from 0.30% to 0.60%. [10, 11] In hybrid, the wound infection rate was 6.53%, which is less than what literature has reported for open onlay and open inlay repair and comparable to open sublay repair. However, wound infection rates were lower for standard IPOM technique.

Chronic pain after standard IPOM has been reported in the range of 2.75%. Hybrid repair combines the safety of open surgery with several advantages of the laparoscopic approach with good surgical outcomes in terms of recurrence, seroma and incidence of chronic pain.

## 4. Conclusion

Hybrid ventral hernia repair is novel technique in the management of complex ventral traumatic/incisional hernias and represents a natural evolution in advancement of hernia repair. It reduces the morbidity of large abdominal flaps of open repair while preserving the benefits of laparoscopic approach such as the placement of a large underlay mesh and fixation under vision and identification of occult hernias. It allows safe adhesiolysis and safe bowel handling and reduction in patients of incarcerated hernia with extensive adhesions, reducing the risks of inadvertent enterotomies. hybrid repair combines the safety of open surgery with several advantages of the laparoscopic approach with good surgical outcomes in terms of recurrence, seroma and incidence of chronic pain.

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