

Case Report

Nigam's hybrid intraperitoneal onlay mesh technique: an ideal procedure for big ventral hernia in an obese patient with hanging abdominal wall – a case report

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ABSTRACT

Nigam's hybrid intraperitoneal onlay mesh technique (NH-IPOM) for big ventral hernia in an obese patient is the ideal surgical procedure. NH-IPOM is ideal for large incisional hernias specially in obese individuals where the redundant abdominal wall is hanging down. Incisional hernia repair is a common but troublesome problem develops after laparotomy for various reasons. Repair of incisional hernia is difficult as well as complicated specially in large hernia. It is operated by laparoscopic and open technique. Common methods of laparoscopic repair of incisional hernia are IPOM, IPOM-plus and hybrid-IPOM. Hybrid-IPOM is a combination of open and laparoscopic methods. We have developed our hybrid-IPOM technique, called NH-IPOM technique which is a combination of laparoscopic and open surgery. NH-IPOM is ideal for large incisional hernias specially in obese individuals where the redundant abdominal wall is hanging large hernia is excised and wound is closed. NH-IPOM is ideal procedure for such hernias due to low rate of complications including recurrence. NH-IPOM technique is easy and curative, but requires more studies.

Keywords: Hybrid-IPOM, Incisional hernia, IPOM, IPOM-plus, Laparotomy, NH-IPOM

INTRODUCTION

Incisional hernia is one of the most common and troublesome complication after abdominal surgery for both the patient and the treating surgeon, it occurs approximately in 2-20% cases of laparotomy. Big incisional hernias in an obese individual with hanging abdominal wall is not easy to cure by common surgical procedure. It requires a combination of surgical procedures to produce good results with cosmetic outcome.

A complex incisional hernia is a large hernia with severe abdominal defect with loss of domain. Usual standard treatment for such hernia is not sufficient and we have to go for specialized surgical procedures like component separation and abdominal wall reconstruction to achieve cure. Very large or giant hernias are difficult to operate and not easy to avoid recurrence. Recurrent hernias are

difficult to repair due to state of tissue and multiple loculi. Loss of domain is an important factor for repair of big and complicated hernia. Obesity, diabetes and smoking add to the challenges of such hernias into healing after complex surgery. Hernia repair is not the only matter in such hernia but reconstructing the abdominal wall should also rebuild the abdominal wall strength. Here, a large mesh plays a part to strengthen the area. Recurrence and infection are two important factors in complex hernias to be avoided.

A giant or big incisional hernia is more than 10 cm in width and requires specialized surgical procedure which takes care of loss of domain and recurrence along with precaution of wound infection. There are few surgical procedures for such hernia i.e. open hernia repair with sublay mesh, component separation technique, intraperitoneal onlay mesh (IPOM) repair, IPOM-plus repair, extended totally extraperitoneal repair (eTEP) and

hybrid procedures (a combination of laparoscopic and open procedures). Preoperative optimization by recommendation to reduce weight, stop smoking and improve health problem helps in healing of the hernia site in addition to prevention of recurrence and infection. It has been suggested that hybrid approach is a feasible and safe approach for difficult post-operative ventral hernia.¹

The first proposal of hybrid IPOM surgery came from a Chinese group in 2012.² Laparoscopic IPOM repair was accepted due to the advantages of decreased post-operative morbidity (mainly wound related) compared to the open approach.³ However, some common sequel associated with laparoscopic IPOM include seroma formation, bulging and failure to restore abdominal walls function.⁴

We have developed a hybrid technique specially for big incisional hernia called NH-IPOM repair. In NH-IPOM, we first do laparoscopic evaluation of hernia defect, observing size, shape and adhesions and then decide whether NH-IPOM is feasible to do or we should go for open surgery. If we plan for NH-IPOM then we remove the adhesions laparoscopically intraperitoneally very carefully avoiding injury to intestinal loops included in adhesions. When the hernia defect site is cleared of adhesions and the area for placement of prosthetic mesh is prepared well, we shift for laparotomy. An incision is made over the most prominent part of hernia swelling in the middle, on the anterior abdominal wall. By going deeper, we enter the hernia cavity. We now clear the adhesions from outer side also and assess the hernia defect for its size, shape, edge and consistency of margin. The closure of the defect is usually done by continuous suture with no. 1 loop prolene which usually covers the whole length of hernia defect even if it is big as the length of loop suture is quite big (1.5 meter). Then again, we work laparoscopically to place prosthetic mesh over the repaired defect covering it sufficiently. The mesh is fixed by absorbable tacks. Now the laparoscopic port site openings are closed with staples. We do not remove hernia sac as in big hernia it is difficult and it increases chances of seroma and hematoma formation considerably.

We now remove the excess of skin, subcutaneous fat and close the laparotomy wound by simple staples as the wall only contains skin and a thin layer of subcutaneous tissue. We believe that open repair of hernia defect is better in strength and tenacity than laparoscopic method and also one can palpate and feel the repair and assess the strength and tenacity of the repaired area better than laparoscopically.⁵

NH-IPOM is a specialized surgical technique for treating large and complex incisional hernias. It combines open surgery (laparotomy) with laparoscopic methods, targeting obese patients or cases where the abdominal wall defects are too large or rigid for a purely laparoscopic approach. NH-IPOM reduces the extreme tension placed on the abdominal wall, lowering hernia recurrence rates and complications commonly associated with complex ventral

hernias. Several authors have reported improved surgical outcomes.⁶ The recurrence rates in laparoscopic IPOM, contrary to expectations, still range between 4.4% and 29%, almost at par with open technique.⁷⁻⁹

CASE REPORT

A 49-year-old obese female patient attended OPD with lower abdominal protrusion and pain. She was also suffering with diabetes and hypertension. The lower abdomen was also hanging down on standing causing severe discomfort and dragging pain. She also had vomited twice in last 24 hours.

There was no family history of hernia, or such other ailment. There was no history of any previous operation. She was admitted in the hospital. Her demographics were recorded which revealed height 155 cm, weight 89 kg and BMI 38/kg/m². Informed consent was taken from the patient. Vitals were normal, well within normal range. The whole abdomen was distended and a huge ventral hernia was found in lower abdomen below the umbilicus. The lower abdomen was hanging down with protrusion. Routine blood tests were also within normal limits except the TLC, which was 11800/mm³. Abdominal ultrasonography and contrast enhanced computed tomography (CECT) revealed a big ventral hernia with omentum and loops of small intestine. We decided to perform NH-IPOM operation. First, we wanted to assess the feasibility of NH-IPOM and, if possible, to do it or go for open surgery. We placed three trocars, at Palmer's point, in epigastrium and in right side of abdomen below right hypochondrium. We did evaluation laparoscopically and found it was feasible to perform NH-IPOM. Surgery was performed under general anesthesia. Evaluation revealed dense adhesions of hernia sac with loops of small intestine. Through laparoscopic procedure we did adhesiolysis and release of loops of small bowel (Figures 1 and 2) slowly without causing any enteric trauma. Then a vertical incision was made in the center of the hernia bulge as the hernia shape was oval vertically. Now adhesiolysis was performed on outer side also to clear the edge of the hernia defect and around. Then the hernia defect was closed with continuous no. 1 prolene (loop) suture manually. The repaired defect was palpated for air tight closure and the strength of the repaired area. By palpation a search was also made for any other undetected occult hernia but no other hernia was noticed.

Then the composite mesh (Ventralight-ST) of 20×15 cm was placed over the repaired hernia defect through laparoscopy and fixed with absorbable tacks. Then, the excessive skin with subcutaneous tissue was excised to remove hanging belly part for strength and cosmetic point of view. The laparotomy wound was closed with skin staples. A drain was also placed in laparotomy area. Finally, all the three ports of laparoscopic procedure were closed with staples after placing another drain in the peritoneal cavity. Operation site was dressed with betadine-soaked gauze pieces. An abdominal belt was

applied. The total time consumed by NMH-IPOM in this case was 120 minutes. The patient was discharged on 4th post-operative day with the drains which were removed on 6th postoperative day during follow up visit. The abdominal belt was removed gradually in third week after the operation (Figure 3). The patient was kept under follow-up for 6 months and no recurrence or other complication happened.



Figure 1: Hanging abdominal wall with lower abdominal ventral hernia.

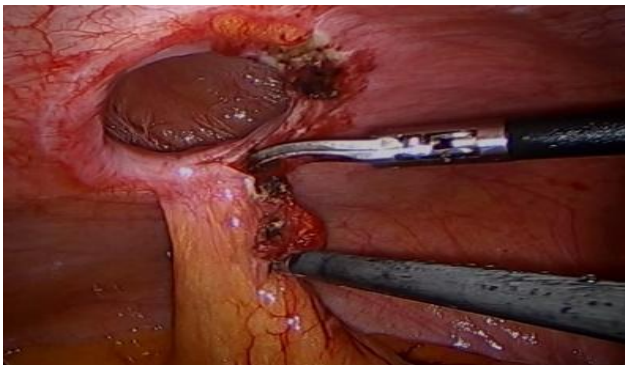


Figure 2: Adhesions and entrapped loop of small bowel.



Figure 3: Composite mesh fixed on repaired hernia site with absorbable tacks.

DISCUSSION

IPOM is an ideal operation for incisional and other big ventral hernias. It is a combination of laparoscopic and

open surgical procedures resulting in saving time during surgery and reducing complications including the recurrence of hernia. The mesh is placed after repair of the hernia defect. It is a good option for big ventral hernia in an obese individual. It gives a better strength to the repair and anterior abdominal wall helping to keep low incidences of recurrence than only laparoscopic repair. This new technique of IPOM has short learning curve. As per the International Endo Hernia Society (IEHS) guidelines, primary tissue repair is suggested for primary <2 cm defects and the large >10 cm hernias are advised to get an open mesh repair. All other hernias can be tackled by open or other minimal invasive approaches. Open repair is thought to be faster and easier especially for surgeons who are new to laparoscopy.^{10,11} Manual repair, we feel, is stronger than laparoscopic repair in strength and tenacity.¹²

Hybrid IPOM procedures are combination of open and laparoscopic surgeries but there are various methods of hybrid IPOM such as NH-IPOM, hybrid component separatism technique (hybrid TAR), hybrid “sandwich repair” eMILOS (endoscopic/mini-or-less open sublay operation), dual-layer mesh hybrid technique and hybrid-robotic IPOM technique.

The hybrid IPOM may not suit all such ventral hernias for which it is developed and so in such cases it should be converted to open hernia repair. In NH-IPOM the first step is to assess the feasibility of IPOM. Decision of feasibility of hybrid -IPOM hernia repair is done initially deciding any chance of conversion to open surgery without wasting time and abandoning the IPOM procedure in middle of the operation to convert to open approach.¹³ LeBauc et al advised as per their work that early conversion saved operative time and had less incidence of iatrogenic bowel injuries.¹⁴ The strengths of NH-IPOM are its ability initially to decide the possibility of doing this procedure or any chance to convert to open surgery, physical strong repair, and low rate of complications including recurrence. The limitation of NH-IPOM is inability to do this procedure in case of big ventral hernia with intestinal obstruction or severe infection.

Laparoscopic IPOM is technically challenging, especially regarding fascial closure. Hybrid repair has been proposed as a simpler approach. Despite of advantages of laparoscopic approach, post-operative morbidity has been reported 3-18% of cases.^{15,16} Hybrid IPOM is a safe and effective method for incisional hernia repair. Moreover, it facilitates fascial defect closure and decreases postoperative seromas.¹⁷

NH-IPOM ideally addresses the complex ventral hernia cases in obese persons where in addition to the ventral hernia the abdomen hangs down due to obesity specially when the individual stands. It is particularly used for complex ventral hernia. With improved cosmetic outcome NH-IPOM not only treats the hernia but also reshapes the anterior abdominal wall with good strength. Particularly,

IPOM repair without hernia defect closure and IPOM with hernia defect closure (IPOM-plus) have become popular techniques worldwide, but NH-IPOM is better than these with more positive outcomes.^{18,19} NH-IPOM also reduces the recurrence rate due to good strength and tenacity at hernia site after repair.

The literature about hybrid-IPOM described two techniques where in the first initial laparoscopy was done with adhesiolysis and repair with or without sac excision followed by laparoscopic IPOM placement.²⁰⁻²² In the second method of hybrid repair as described in the review and articles, exposure of the defect through an incision over the previous scar with adhesiolysis was performed with or without sac excision and defect closed, followed by laparoscopic IPOM placement to complete the repair.²³⁻²⁵ NH-IPOM defers from the above two and other hybrid-IPOM methods as in NH-IPOM the first step is to decide the feasibility of hybrid-IPOM surgery and if it cannot be done then it is abandoned and open surgery is done without wasting time. Repair of hernia defect is done manually and is checked by physical palpation for strength and tenacity which helps in preventing complications as seroma formation and recurrence.

NH-IPOM has following advantages over other hybrid repairs: NH-IPM is the only hybrid procedure which as a first step before start of the repairs accesses the flexible for hybrid repair, so the hybrid IPOM is done or open surgery is done without any delay; low incidence of seroma formation; low incidence of recurrence; reduction of complications; repair of hernia defect is good in strength and tenacity; NH-IPOM is cosmetically very good; and good for recurrent ventral hernia.

CONCLUSION

Incisional hernia repair is usually done now days by IPOM, IPOM-plus and hybrid-IPOM. NH-IPOM is a new technique with advantages of reduced complications and recurrence by providing better strength and tenacity to the hernia repair site. NH-IPOM surpasses IPOM, IPOM plus and hybrid-IPOM due to its advantages over these techniques.

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