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Case Report

Nigam's hybrid intraperitoneal onlay mesh repair of large incisional hernia

Vinod Kumar Nigam*, Siddharth Nigam

Max Hospital, Gurugram, Haryana, India

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***Correspondence:**
Dr. Vinod Kumar Nigam,
E-mail: drnigamvk@gmail.com

ABSTRACT

Incisional hernia repair is done by laparoscopic and open technique. A mesh is placed inside the abdominal cavity over the hernia defect through laparoscopy, it is called as IPOM (Intraperitoneal Onlay mesh repair). The mesh is fixed with tacks or sutures. The IPOM-plus technique is the repair process where the hernia defect is closed before placing the mesh. Hybrid IPOM is a method of repair where a combination of open and laparoscopic procedures is used. Nigam's hybrid-IPOM (NH-IPOM) is a new technique combining laparotomy and laparoscopic IPOM in large incisional hernias specially in obese individuals where the redundant abdominal wall of hanging large hernia is excised and wound is closed.

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

INTRODUCTION

An incisional hernia is a common complication after gastrointestinal surgery and occurs in approximately 2-20% of laparotomized patients.[1] About 15% of the laparotomy incisions would end up developing some sort of incisional hernia ranging from small hernias at the angles to complete suture-failure wound hernia.[2] Incisional hernias usually remain symptomless but always there is fear of increase in size and development of adhesions leading to symptoms like pain and complications. Sometimes the complications can become serious like, intestinal obstruction and strangulation. Frequent complications are reherniation, seroma formation and wound infection.[3,4]

The management of incisional hernia is challenging in relation to recurrence and development of complications. Midline abdominal incisions are more prone for incisional hernia than lateral incisions. Usually there is a reducible bulge at the site of previous abdominal surgery with cough impulse. Incisional hernias develop because of the failure of the abdominal wall to close properly.[5] Obesity, diabetes mellitus, smoking, are common risk factors for development of incisional hernia. Morbid obesity is a common associated risk factor.[6]

IPOM technique to repair incisional hernia is the laparoscopic hernioplasty in which the prosthetic mesh is placed over hernia defect from intraperitoneal route. In IPOM-plus in addition to placing a mesh intraperitoneally to reinforce the anterior abdominal wall the defect is also closed with sutures. In hybrid IPOM we do a laparotomy also in addition to IPOM through the hernia swelling itself and may repair the defect. NH-IPOM is a procedure developed by us which is hybrid IPOM plus incisional hernia repair through laparotomy for incisional hernia. NH-IPOM is mainly required in difficult and big cases of incisional hernia usually larger than 10 cm specially in obese patients and in addition we also remove the redundant abdominal wall layers at hernia site. In these difficult cases primarily, we consider three types of problems: Big incisional hernia (more than 10 cm) with considerable adhesions. Recurrent cases of incisional hernia which is bigger than 10 cm. Big incisional hernia

(more than 10 cm) in obese patients with hanging belly where extra skin with various layers of abdominal wall is required to be excised.

In NH-IPOM, we first do laparoscopic evaluation of hernia defect, size, and adhesions and decide that 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 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 hernia cavity. We now clear the adhesions 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 mesh over the sutured defect covering it sufficiently with prosthetic mesh. 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 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 one can palpate and feel the repair and assess the strength and tenacity of the repaired area better than laparoscopically.

DISCUSSION

Incisional hernia may be asymptomatic but usually it has progressive enlargement. Intestinal obstruction may develop as a serious complication which may lead to life threatening strangulation of bowel and to prevent this serious problem incisional hernia should be treated early.

Laparoscopic repair of incisional hernia is considered as to have superior outcomes in terms of recurrence and postoperative complications than open surgery.[7] Particularly, IPOM repair without hernia defect closure and IPOM with hernia defect closure (IPOM-plus) have become prevalent techniques worldwide.[8,9]

The first proposal for hybrid IPOM surgery came from a Chinese group in 2012.[10] Hybrid IPOM technique is now in use widely and it's rate of recurrence and complications are reported to be comparable to open/laparoscopic repairs.[11] Hybrid-IPOM is a combination of both laparoscopic and open approaches for repair of incisional hernia. Hybrid hernia repair has been reported by many other authors to have less chances of seroma, less mesh ballooning, and a better mesh fixation, but we feel the less recurrence and less major postoperative complications are the main advantages.[12,13]

NH-IPOM has some advantages over IPOM-Plus and hybrid-IPOM: Though the NH-IPOM is done in various steps but it gives satisfaction of good and strong incisional hernia repair. The repair is felt physically by manual palpation and not by instruments which gives chance to reinforce the repair if required on assessment by palpation. Manual repair, we feel, is stronger than laparoscopic repair in strength and tenacity. Any occult or undetected hernia also can be detected on palpation in NH-IPOM procedure. Decision of feasibility of hybrid-IPOM hernia repair is done initially deciding any chance of conversion of open surgery without wasting time and abandoning the IPOM procedure in middle of the operation to convert to open approach. Complications like seroma and hematoma formation are minimal. Hanging belly problem is also solved. NH-IPOM also reduces the recurrence rate due to good strength and tenacity at hernia site after repair as confirmed by our experience.

CASE REPORT

An obese woman of 50 years with body mass index of 31 kg/m^2 attended our OPD with a big incomplete reducible swelling in lower mid abdomen. The swelling appeared 8 months back after a lower midline laparotomy for perforated appendicitis with generalized peritonitis. The swelling gradually increased over last 8 months and has attended the size of 14×10 cm at the time of attending hospital.

The incisional hernia started 6 months after laparotomy and there was no post-operative infection as per records so probably the technique of closure of laparotomy wound was defective. She was not having major complaints but suffered from occasional dragging pain and constipation. The pain also happened on fast walking as there was also mild degree of hanging belly. Physical examination revealed obesity, abdominal bulge below umbilicus in midline, hanging belly on standing. The skin of the bulge was normal only with stretch marks. Contrast enhanced computer tomography (CECT) exhibited small bowel loop herniating in the bulge. There was a defect of 7×8 cm between two rectus abdominis muscles. The anterior abdominal wall at the hernia site was only 1 cm thick containing skin and subcutaneous tissue layer. There was no signs of obstruction, strangulation or incarceration.

After considering physical examination findings and imaging report we decided to do NH-IPOM. Preoperative preparations were carried out after admission and informed consent was taken. Surgery was planned under general anesthesia. Pneumoperitoneum was created through Palmer's point. A 5 mm camera port and two 10 mm working ports were created (Figure 1). Firstly, the inspection of abdominal cavity was done with assessment of hernia defect and adhesions. One loop of small

intestine was found adhered with the right margin of the defect along with adhesions (Figure 2). Adhesions were also present on other parts of the margin of the hernia defect.

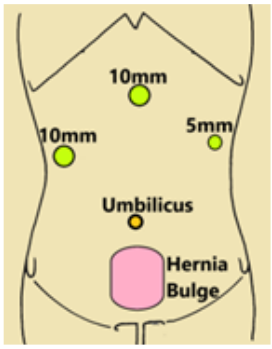

Figure 1: Hernia bulge.

We decided that NH-IPOM was feasible and could be done with adhesiolysis and release of the trapped loop of small bowel so adhesiolysis was done and very carefully and gently the trapped loop of small bowel was released. Secondly, a vertical incision was made in the center of the hernia bulge as the hernia shape was oval vertically. Adhesiolysis was performed to clear the edge of the hernia defect. Then the hernia defect was closed with continuous No. 1 prolene (loop) suture. The repaired defect was palpated for airlight 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.

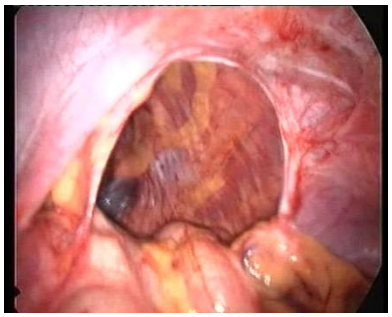

Figure 2: Adhesions and entrapped loop of small bowel.

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

Thirdly, the composite mesh (Ventralight-ST) of 15×15 cm was placed over the repaired hernia defect and fixed with absorbable tacks (Figure 3).

Fourthly, the excessive skin with subcutaneous tissue was excised to remove hanging belly on standing. 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 140 minutes. The patient was discharged on 4th post-operative day with the drain which was removed on 10th day during follow-up visit. The abdominal belt was removed gradually in third week after the operation.

CONCLUSION

Incisional hernia repair is usually done now a 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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Ethical approval: Not required

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