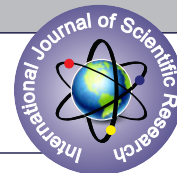


NEWER APPROACH TO VENTRAL HERNIA REPAIR – LAPAROSCOPIC TRANSABDOMINAL RETROMUSCULAR (TARM) TECHNIQUE - A RETROSPECTIVE STUDY



General Surgery

Dr Abadhesh Sharma

MBBS, MS, FNB-MIS, Mahatma Gandhi Medical College and Hospital. Jaipur

Dr Prashant Jain

MBBS, MS Resident, Mahatma Gandhi Medical College and Hospital. Jaipur

Dr Sanjay Singhal

MBBS, MS, Mahatma Gandhi Medical College and Hospital. Jaipur

Dr Saroj Chhabra Kapoor

MBBS, MS, Mahatma Gandhi Medical College and Hospital. Jaipur

Dr Deepak Bishnoi

MBBS, MS, Resident, Mahatma Gandhi Medical College and Hospital. Jaipur

Dr Bharat

Bhushan Sharma

MBBS, MS Resident, Mahatma Gandhi Medical College and Hospital. Jaipur

KEYWORDS

INTRODUCTION

Laparoscopic ventral hernia repairs are one of the common surgical procedures performed in everyday clinical practice. Incisional hernia are common long-term complication in 11–20% of laparotomy incisions.^{1,2} Within the first 2 years, almost 50% of incisional hernias develop after the primary surgery, and 74% develop after 3 years.^{3,4} The recurrence rate of incisional hernia which was more than 50% after the primary suture repair has now been reduced to 10–23% after use of prosthetic meshes in hernia repair.⁵

Sublay mesh placement like in the open Rives–Stoppa repair (ORS) has been favored due to the increasing complications of the intraperitoneal onlay mesh repair (IPOM).⁷ To restore the biomechanics of the abdominal wall, midline closure is recommended.⁶ Several techniques have been developed based on this concept like trans-peritoneal and trans-extra-peritoneal sublay repair.⁸ However there was a need for a low cost laparoscopic transabdominal retromuscular repair⁶, using polypropylene mesh.

Ventral hernias

Ventral hernias are non inguinal non hiatal defects in the musculoaponeurotic fascia of the abdominal wall. According to European Hernia Society (EHS), these are classified into midline, lateral and incisional hernias.

The abdomen was divided into a medial or midline zone and a lateral zone. Medial or midline hernias The borders of the midline area are defined as: (1) cranial: the xiphoid (2) caudal: the pubic bone (3) lateral: the lateral margin of the rectal sheath. Thus, all incisional hernias between the lateral margins of both rectus muscle sheaths are classified as midline hernias.

The borders of lateral hernia are defined as: (1) cranial: costal margin (2) caudal: the inguinal region (3) medial: the lateral margin of the rectus sheath (4) lateral: the lumbar region

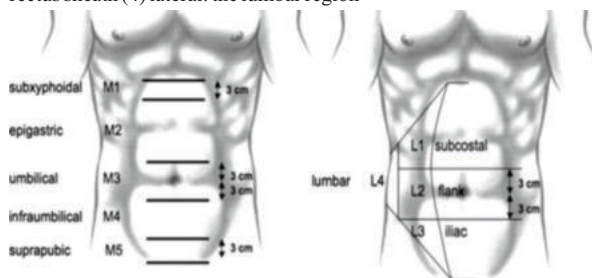


Fig 1. classification of ventral hernia

Transabdominal Retromuscular Repair

Laparoscopic transabdominal retromuscular repair for ventral hernia

is a low cost novel technique based on the principle of open rives stoppa repair. The mesh is placed in the space behind the rectus abdominis and above the posterior rectus sheath.

As there is no use of tackers to fix the mesh it is associated with less postoperative pain. The stoppa's principle was originally used for the open repair of giant visceral hernias called giant prosthetic reinforcement of the visceral sac (GPRVS). Combined with laparoscopic technique, this provides the advantage of both open rives stoppa repair and minimally invasive surgery

Port placement and ot setup

The patient is positioned supine with an OT table flexed. Modified lithotomy position can also be used but the former is preferred. Ports are placed on the side opposite to the hernia.

We performed a 3 port technique with a 10 mm camera port in the midline and two 5 mm working port on each side, but medial to the linea semilunaris.



Fig 2. ports placed for the epigastric hernia.

Creation of pneumoperitoneum

Pneumoperitoneum is created and the hernial sac can be visualized clearly due to the traction created because of the pneumo. We attempt to remove the adhesions and the sac is opened and the contents reduced

Raising P-PRS flap

Proximal to the defect, we make a transverse incision over the peritoneum to raise the peritoneum - posterior rectus sheath flap (P-PRS).

We do this on both sides and dissect the retrorectus space (space behind the rectus abdominis muscle and above the posterior rectus sheath). This space has excellent vascularity and is ideal for mesh placement due to better remodeling.

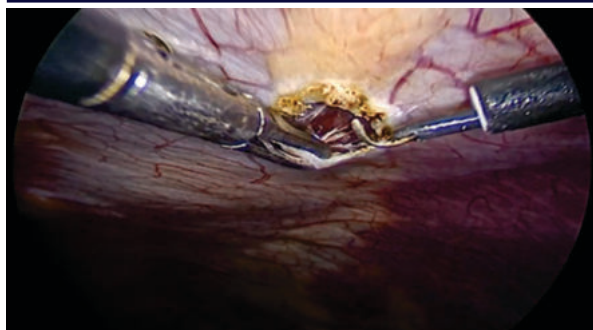


Fig 3. incision of the peritoneum and raising the P-PRS flap

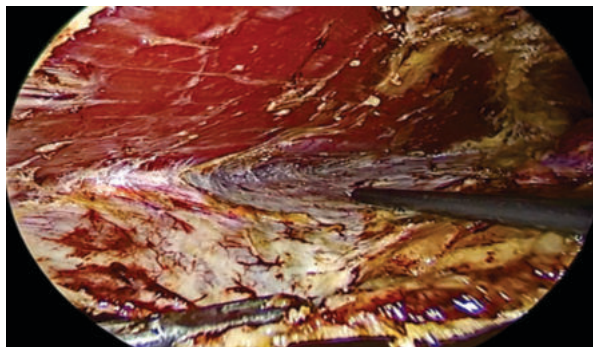


Fig 4. the right retrorectus space dissected up to the linea semilunaris.

Defect closure and mesh placement



Fig 5. mesh placement

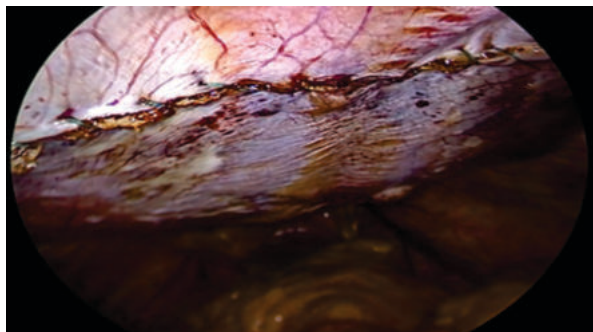


Fig 6. defect closure with vLoc suture

We use a normal polypropylene (PPM) mesh and this is placed in the retrorectus space created. Fixing the mesh edges with prolene suture is optional and depends on the surgeon's preference. Mesh should be placed adequately covering upto 5-6 cm all around the defect. After placing and / or fixing the mesh, we begin closing the incision given at the beginning to raise the P-PRS flap. This is done with the help of knotless surgical sutures having barbs on their surface. These barbs penetrate the tissue being sutured and locks the suture in place eliminating the need to tie knots.

Method

There were 21 patients in this group, including 14 men and 7 women,

aged 31 - 78 years, with an average age of 45 years. Period of study was August 2021 to January 2022. Intraoperative and postoperative complications, operative times, postoperative pain, length of hospital stay and hernia recurrence were assessed.

There were 7 cases of incisional hernia, 3 cases of umbilical hernia, 4 cases of epigastric hernia and 7 cases of infraumbilical hernia

Table 1.

	Operative time	Iatrogenic injury to bowel	Postoperative pain	Seroma formation	Hospital stay	Recurrence on 3 month follow up
Incisional hernia	45 min	No	2 / 10	Two out of 7 cases	5 days	No
Epigastric hernia	33 min	No	1 / 10	No	3 days	No
Umbilical hernia	41 min	No	2 / 10	One of 3 cases	3 days	No
Infraumbilical hernia	42 min	No	2 / 10	No	3 days	Yes

RESULTS

21 cases of ventral hernia were successfully completed. Out of 33 % cases of incisional hernia repair, seroma formation was present in 2 cases. Mean operative time was 40.25 minutes. There was no iatrogenic bowel injury. Mean length of hospital stay was 3.5 days. Recurrence was seen in one case of infraumbilical hernia repair over a follow up period of 3 months. 2 incisional hernia repairs and one umbilical hernia repair were complicated by seroma formation. Overall prognosis was good. Postoperative pain was one on a scale of 10 among the majority of patients.

CONCLUSION

More than 20 million hernias are operated worldwide. Out of these 25 - 30% cases are ventral hernia repairs. Incisional hernia being the commonest among these. Ventral hernia repair through laparoscopic transabdominal retromuscular repair is a low cost novel technique which is skill based and a normal polypropylene mesh is sufficient. As composite or dual biological meshes are not required, the cost of ventral hernia repair is reduced by approximately 70%.

REFERENCES

1. Bloemen A, van Dooren P, Huizinga BF, et al. Randomized clinical trial comparing polypropylene or polydioxanone for midline abdominal wall closure. *Br J Surg.* 2011;98:633-639. [PubMed] [Google Scholar]
2. Van't Riet M, Steyerberg EW, Nellensteyn J, et al. Meta-analysis of techniques for closure of midline abdominal incisions. *Br J Surg.* 2002;89:1350-1356. [PubMed] [Google Scholar]
3. Pollock AV, Evans M. Early prediction of late incisional hernias. *Br J Surg.* 1989;76:953-954. [PubMed] [Google Scholar]
4. Anthony T, Bergen PC, Kim LT, et al. Factors affecting recurrence following incisional herniorrhaphy. *World J Surg.* 2000;24:95-100; discussion 101. [PubMed] [Google Scholar]
5. Luijendijk R, Hop W, Van den Tol MP, et al. A comparison of suture repair with mesh repair for incisional hernia. *N Eng J Med.* 2000;343:392-398. [PubMed] [Google Scholar]
6. Rosen MJ, Fatima J, Sarr MG (2010) Repair of abdominal wall hernias with restoration of abdominal wall function. *J Gastrointest Surg* 14(1):175-185.
7. Stoppa RE (1989) The treatment of complicated groin and incisional hernias. *World J Surg* 13(5):545-554.
8. Belyansky I, Daes J, Radu VG, Balasubramanian R, Reza Zahiri H, Weltz AS, Sibia US, Park A, Novitsky Y (2018) A novel approach using the enhanced-view totally extraperitoneal (e TEP) technique for laparoscopic retromuscular hernia repair. *Surg Endosc* 32(3):1525-1532