Laparoscopic ventral hernia repair

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Abstract
Laparoscopic ventral hernia repairs using onlay polypropylene mesh grafts and metal staplers were performed in 6 patients, 5 females, 1 male. Age range from 40 - 66 years. Hernias size were 2 - 15 cm. Two were complex cases. Operative time was 70 - 200 min. Hospital stay were 4 - 10 days. Follow up time was between 2 - 12 months. With only one complication; cellulitis; abdominal wall which required only antibiotic treatment.

Background
การผ่าตัดใส่เยื่อบุหลากหลายอุณหภูมิของมันหน้าท้องโดยวิธีการสองกลอง

ได้ผ่าตัดเยื่อบุUnterlay hernia repairs in 6 patients that were laparoscopic using polypropylene mesh. 5 females, 1 male. Age range from 40 - 66 years. Hernias size were 2 - 15 cm. Two were complex cases. Operative time was 70 - 200 min. Hospital stay were 4 - 10 days. Follow up time was between 2 - 12 months. With only one complication; cellulitis; abdominal wall which required only antibiotic treatment.

Introduction
Conventional surgical repair to large abdominal wall hernia causes many concerns regarding tension of abdominal wall and breathing distress after surgery. To reduce abdominal tension, it frequently requires prosthetic material to cover defect. At this laparoscopic surgery are, Laparoscopic inguinal hernia repair is accepted as an alternative standard operation. Schultz L. et al reported using polypropylene mesh graft for repair inguinal hernia in 20 patients with good result. Dison Y. reported 10 cases with satisfied outcome. Combination of physiologic inguinal hernia repair and using, polypropylene mesh onlay the defect held by metal staple and laparoscopic technique has generated enthusiasm for the application toward laparoscopic ventral hernia repair.

Objectives
1. To study and apply the technique of operation using laparoscopic technique and synthetic polypropylene mesh for large abdominal hernia repair.
2. To study the complication that may occur in using this technique.
3. To study the advantages and disadvantages of this technique of operation.
4. To study the recurrence rate.

Patients selection
1. The patients who have large abdominal hernia or multiple hernias, which could not be repaired without mesh graft to close the hernial defect.
2. The patients should have no contraindication for major surgery, problems uncontrolled diabetes, etc.

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3. The patients must have no contraindication for laparoscopic surgery, such as coagulation problems, inflammation of the peritoneum, pregnancy, etc.

4. The patient should accept this operative technique.

**Instrumets for the operation**

1. Standard laparoscopic equipment

   - Laparoscopic set with transducer and television set
   - Xenon light source
   - Automatic CO₂ gas high flow insufflator
   - Instrument, forceps, scissors, electric cautery hook probe

2. Synthetic polypropylene mesh grafts of different sizes

3. Stapler for fixing mesh to abdominal wall

**Method and Operation**

1. Under general anesthesia, patient was placed in supine position.

2. The placement of nasogastric tube and Foley urinary catheter was mandatory.

3. The abdominal wall was prepped and draped.

4. Veress needle was inserted into the abdominal cavity. Position was varied to avoid injury to abdominal viscera.

5. CO₂ gas was installed in the abdominal cavity limit pressure about 15 mmHg.

6. A 10/12 mm trocar was introduced into the peritoneal cavity at the site of veress needle. Care was taken to avoid injury to abdominal viscera.

7. Place laparoscope into the trochar, explore the abdominal viscera, especially at the hernial site.

8. Insert the other 2-3 trochars, size 10/12 min or 5 mm into the abdominal wall at the suitable position to perform the operation.

9. Use grasper forceps, scissors and electric cauterization hook probe to separate adhesion, viscera and omentum from anterior abdominal wall and hernia.

10. Estimate the size of hernia and normal abdominal wall for the size of synthetic graft.

11. Cut the synthetic polypropylene graft 2 cm. Larger than the estimated area in each side to cover the area of hernia.

12. Put the graft through the 10/12 mm trochar into abdominal cavity and use grasper to spread the graft to cover the hernial defect.

13. Use stapler to fix the synthetic graft to the strong abdominal wall, the space in between the clips is approximately 2 cm.

14. Use grasper forceps to test the strength of the synthetic graft, Some more clips may be required to fix the mesh.

15. Remove all instruments and trocars from the abdominal wall.

16. Close fascia of 10/12 trochar wounds with 0/0 vicryl.

17. Close puncture skin wounds with 5/0 Nylon.

**Results**

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<th>time to remove suture (min)</th>
<th>post-op pain</th>
<th>complication</th>
<th>duration of hospital stay (days)</th>
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**Discussion**

Laparoscopic repair of ventral hernias were performed in 6 patients, 5 females and 1 male. All had large ventral
hemis or combination of ventral and inguinal hernias. The fifth patient had a double ventral hernia and a small key hole ventral hernia which was not detected on the physical exam. This small 2 cm. ventral hernia was found on hystero scope view.

Timing of the operation depended upon the amount of visceral adhesion to the abdominal wall, the size of the hernia and the Surgeon's experience.

The second patient had 2 ventral hernias (4 cm. and 8 cm. in size) at the middle part of abdominal wall. He was repaired with a single sheet of graft.

The fifth case who had 2 hernias (4 cm. and 2 cm. in size) at the lower abdominal wall below umbilical area and a right inguinal hernia. After repair ventral hernia, we repaired inguinal hernia simultaneously with transperitoneal approach in the same intervention.

The longest hospitalization was 10 days and the shortest was 3 days.

One patient had complication. There was cellulitis on the abdominal wall which needed 4 days or intravenous antibiotic treatment followed by a week of oral antibiotics.

There was no recurrence of hernia in all of the 6 patients. The longest period of follow up was one year and the shortest period was 3 months. Results were satisfactory. No severe complications were observed. Long term follow up is needed.

Laparoscopic repair of ventral hernia found many advantages:

1. It was able to fine out other unexpected abnormal such as small key hole ventral hernia, ovarian cyst.
2. It was able to treat other abdominal diseases in the same intervention such as cholecystectomy, inguinal hernia repair.
3. It was able to closed abdominal defect without tension in abdominal wall. Post-operative discomfort seems low.

A disadvantage point was the amount of time consumed to dissect the adhesion away from abdominal wall, especially in case of severe adhesion and in case of large ventral defect. Reaction of polypropylene mesh which is contact to the abdominal visera may cause move adhesion or erosion to harm visceral organs even though reported by Usher et al admit in repair ventral and inguinal hernia.

And Becher, et al. reported comparison of adhesion formation intra peritoneal laporoscopic and laparoscopic hernioplasty techniques showed no exsapposition of peritoneum resulted in a statistically lower incidence of adhesions.

Laparoscopic ventral hernia repair using synthetic polypropylene mesh graft is a convenient procedure. There is no need to make large incision on the abdominal wall, no problem in difficulty of respiration or dyspnea after operation, slight pain, and rapid recovery. We followed up the patient for 1 year. All of the six patients still have no recurrent signs and we are going to continue following up them longer.

Reference