

Case Report

A case of hepatic cirrhosis combined with ascites and incarcerated hernia by preperitoneal approach repair through hernia sac top pathway

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ABSTRACT

The incidence of hernia is increased in patients with hepatic cirrhosis with ascites. But inguinal hernia with ascites is considered as surgical contraindication. Because there are many complications after surgery, such as hernia recurrence, feeling of swell in reparative area, incision fluid effusion. We report an 85 year-old Chinese male who presented to the emergency department with incarcerated inguinal hernia 9 hours. An urgent preperitoneal hernia repair by Hernia Sac Top pathway was performed. The surgery was successful and there were no complications occurred after the patient followed up 16 months. The novel approach was reliable and valuable. The report of the new approach should be encouraged.

Keywords: Hernia sac top, Incarcerated hernia, Cirrhosis, Refractory ascites

INTRODUCTION

Surgical repair of inguinal hernia combined with ascites is intractable, which is discouraged by postoperative complications, difficultly to be handled, such as hernia recurrence, feeling of swell in reparative area, incision fluid effusion, etc., because of continuous high abdominal pressure. We have chosen preperitoneal tension-free herniorrhaphy by HST pathway recently. The key of surgery procedures includes putting drainage tube in the abdominal cavity, negative pressure suction device under the oblique muscles aponeurosis postoperative, so as to control the volume of ascites actively.¹ At the same time, the pressure of abdominal pressure decreased. What's more, it keeps the integrity of transverse fascia, which increases its ability to resist high abdominal cavity pressure, lessening the incidence of postoperative complications. Here, we present that we use the new technique named HST pathway preperitoneal approach

incarcerated inguinal hernia repair to treat a patient with cirrhosis, ascites, intestinal obstruction, chronic kidney dysfunction and hypertension.²

CASE REPORT

An 85-year-old Chinese man, known to have reducible mass in right inguinal region for 2 years, was admitted to our hospital complaining of a big inguinal swelling On October 18, 2013. 9 hours prior to admission, it became tense and painful. The swelling could not be returned. His past medical history included cirrhosis, ascites, hypertension, chronic kidney dysfunction, coronary heart disease and coronary stent implantation. He also had a history of esophageal variceal bleeding four months ago, which made him had to be hospitalized.

At initial assessment, the patient was found to have a firm, tensile swelling in the right groin which was

diagnosed as an incarcerated inguinal hernia. The blood routine examination showed that he had normal white cell count of $4.0 \times 10^9/L$, but an elevated neutrophil ratio of 89.4%. He also had an elevated urea nitrogen of 12.90 mmol/L and an elevated creatinine of $150 \mu\text{mol/L}$ (normal value: $1-106 \mu\text{mol/L}$). His liver function and coagulation function were normal. He had an acute pain face with a tensive abdominal mass which is about $14 \times 7 \text{ cm}$ in right inguinal region. He was not tachycardic or tachypnoeic. He had a soft but distended abdomen. We could hear hyperactive bowel sounds with gurgling. The sign of shifting dullness was unclear, for the intestinal pneumatosis. Well, his vital signs are stable. Abdominal x-ray demonstrated incomplete intestinal obstruction. Superficial organ ultrasound showed right incarcerated inguinal hernia. The outcome of electrocardiogram is normal. Echocardiography revealed right ventricle diastolic dysfunction and mild pulmonary arterial hypertension. Unfortunately, the patient didn't do the abdominal B scan ultrasound. He needed emergency surgery cause of suspected strangulation ileus. However, this case was difficult to deal with, because he had a lot of basic diseases, especially his complication of ascites. We carried out necessary preparation quickly, and then we took emergency surgery by hernia sac top (HST) pathway preperitoneal tension-free hernioplasty under general anesthesia. This pathway was our great discovery and successfully applied to multiple patients, which could significantly shorten the operation time and reduce complications.

At surgery, we found a big hernial sac about $14 \times 7 \text{ cm}$, entering into scrotum. When opened the hernial sac, we found approximately 150 ml yellow liquid oozing, and then sucked out it with negative pressure aspirator. Next, we found the contents of hernial sac were small intestine, about 15 cm long. The color of intestine was purple and enterokinesia was poor. We putted a warm sodium chloride gauze around the small intestine. At the same time, we injected 2 ml 1% lidocaine into mesentery of small intestine. After observing for 30 to 40 minutes, we found the color of small bowel returned, the enterokinesia came alive, and mesenteric micro vessel beaten again. These signs proved the intestine was viable. So, we returned the intestine and performed tension-free hernioplasty. Finally, the surgery was successful. However, the first day after the operation, 700 ml clear pale yellow ascites drained out from abdominal drainage tube. The second and third days post operation; there were about 640ml and 400ml ascites, respectively. 2 to 3 days postoperatively, and the patient's creatinine and activated partial thromboplastin time began to rise. The maximum creatinine value was up to $243 \mu\text{mol/l}$ and the activated partial thromboplastin was increased to 54.8 seconds (normal value: 24-40sec). Fortunately, the patient's electrolyte and acid-base level were still keeping in the acceptable range. We adopted the method of plasma transfusion to increase the colloid osmotic pressure, reduce ascites and supplement the clotting factors and an antibiotic (piperacillin-tazobactam) was used to prevent infection. We also adopted the method of improving kidney, liver, heart function, anticoagulant therapy with the low molecular heparin, protecting gastric mucosa, atomization treatment etc. The eighth day after the operation, there were still 600ml clear pale yellow ascites drained out from abdominal drainage tube. Ninth day, no fluid drained out from negative pressure suction device. So, we unplugged it. Tenth day, 900 ml clear pale yellow ascites drained out from abdominal drainage tube. The patient's general condition was good, so we let him take tube out of the hospital. Then, we unplugged it 19th day after operation.

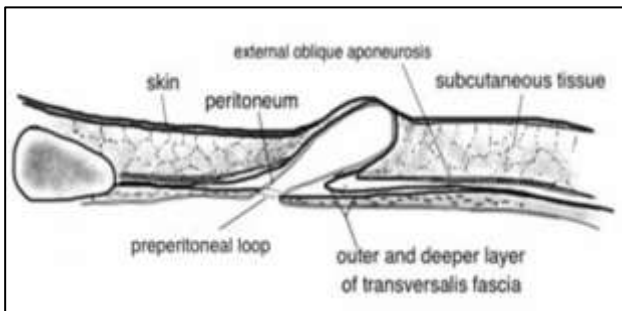


Figure 1: Cross-section drawn of hernia sac.

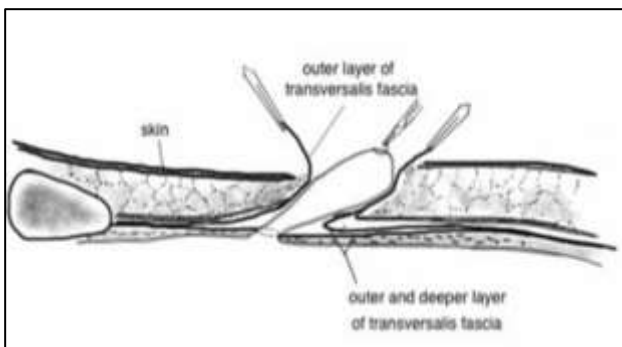


Figure 2: Open outside part of hernia sac.

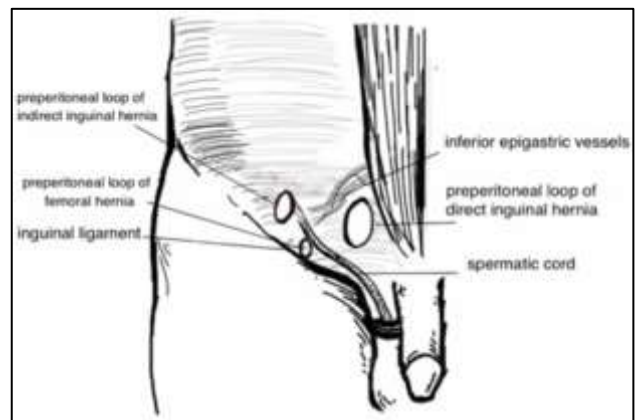


Figure 3: Preperitoneal ring (after opening outer of transverse fascia).

Our Surgical procedures show as follow. We used soft and light flat mesh to repair inguinal hernia by HST pathway. We let the patients be supine, choosing general anesthesia. We took traditional inguinal cut about 4cm. And then we cut skin, subcutaneous tissues, external oblique muscles aponeurosis to expose the hernia sac (Figure 1). Firstly, we must look for the hernia sac correctly by opening cremaster, and then we opened the tissues out of the real hernia sac top, which consists of outside part of the transversalis fascia (Figure 2). Secondly, we opened the hernia sac. We found the contents of hernial sac were small intestine, about 15 cm long. The color of intestine was purple and enterokinesia was poor. And there was yellow liquid oozing in hernia sac. We extracted 2 ml effusion to do bacterial culture and drug sensitivity test post operation. For our effective treatment, the intestine was viable. We returned it to the abdominal cavity. Next, we cut a small incision in the right lower quadrant, drilling to put an abdominal drainage tube in the pelvic cavity (Figure 7) and then fixed it. After that, we used blunt and sharp instrument at the same time to free distal hernial sac until the real crack in deeper layer of transversalis fascia. The structure was the authentic hernia ring. We named it preperitoneal loop (Figure 3, 4), which also was found in laparoscopic TEP technology.¹ The pathway carried out by us is a new way which is never reported by other papers before. The long diameter of the ring was about 2-3 cm. Through the structure, we could go into the preperitoneal space immediately, and the room of preperitoneum was enough to put away the flat mesh. We sutured the opened hernia sac and then separate the preperitoneal space. Then we rinsed the operation field with PVP repeatedly and absorbed the liquid. Next, we fixed the mid zone of the flat mesh on the top of hernia sac with absorbed line (Figure 5). Followed by, Using an oval clamp or forceps on the leash of the mesh, insert the flat mesh and hernia sac into the preperitoneal space by fully flattening the mesh with an index finger or forceps (Figure 6).

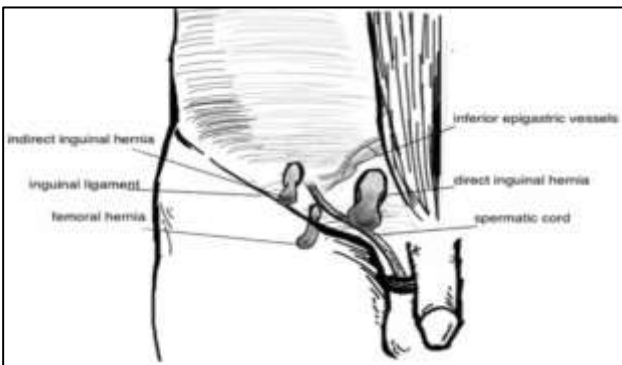


Figure 4: Inguinal hernia.

Then, we closed the crack of transversalis fascia by continuous suture, which could enhance the intensity and the integrity of fascia transversalis.² At the same time, we must fix the leash on the transversalis fascia, and cut the extra leash. We put the upper mesh behind the cord and

conjoint tendon after dividing the cord, which was to enhance the firmness of the transverse fascia. Finally, we placed a negative pressure suction device under the oblique muscles aponeurosis after suturing it (Figure 7). The surgery was successful, and the operation time was 120 minutes. There were no significant blood loss and vital signs were stable. The patient recovered smoothly.

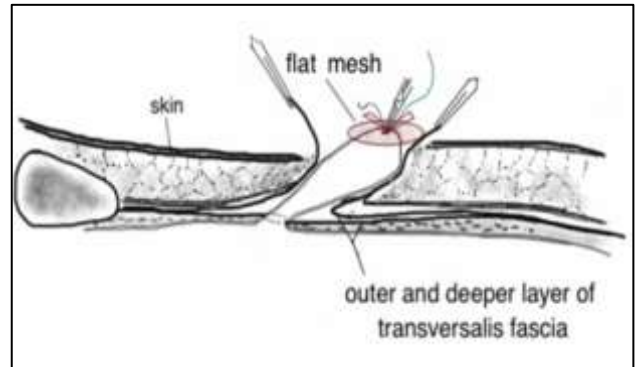


Figure 5: Suture the mid zone of the flat mesh on the top of hernia sac with absorbed line.

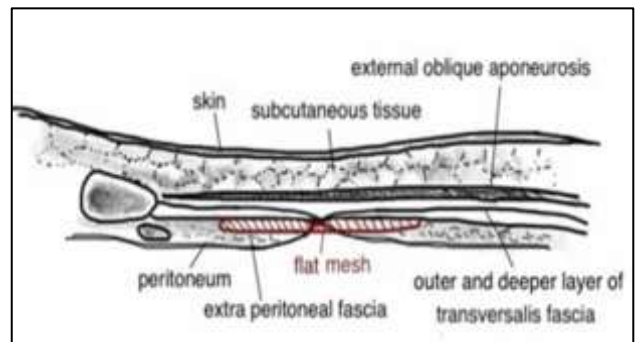


Figure 6: Push the flat mesh and hernia sac into the preperitoneal space and close the crack of transversalis fascia, at the same time fix the leash on the transversalis fascia, and cut the extra leash.

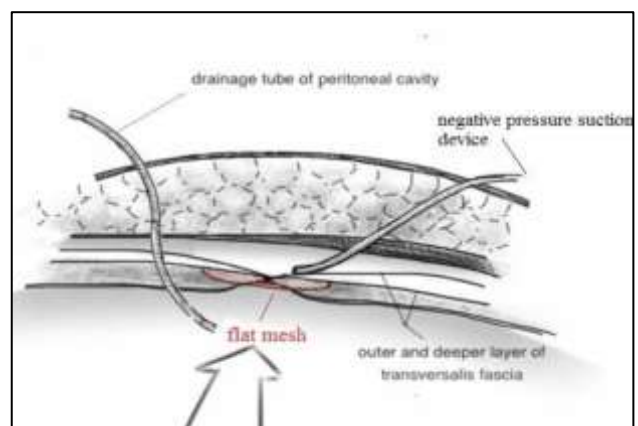


Figure 7: Key of surgery procedures: drainage tube in the abdominal cavity, negative pressure suction device under the oblique muscles aponeurosis.

No postoperative complications occurred including scrotum hematoma, seroma, severe pain and incision fluid effusion etc. And the incision healed well post operation. The patient was followed up about 16 months. No any complications were found, including hernia recurrence, chronic pain, swelling in operative region, painful testis, testicular atrophy etc. Unfortunately, the patient was died of heart failure in February of 2015.

DISCUSSION

Modern inguinal hernia surgery is based on Henri Fruchaud's anatomical theory.³ It shows the central cause of hernia is weak structure in groin area and transverse fascia defect. Lichtenstein proposed the concept of tension-free hernia repair in 1989, and promoted the use of mesh to replace the dysfunctional transverse fascia.⁴ After years of clinical research, tension-free hernia repair surgery was developed from Lichtenstein to PHS surgery. They are all to strengthen transverse fascia and the posterior wall of the inguinal canal by placing mesh among peritoneal space or/and in posterior wall of the inguinal canal, which corrects anatomical abnormality and recovers the normal anatomy and physiological functions in inguinal region maximatily. The advantage of it is that the lighter postoperative pain, faster recovery. For all this, a new, simple, easy-to-do and easy-to-learn technique not requiring extensive dissection is still required.⁵

Based on the above theory, we invent HST pathway tension-free hernia repair. Compared to other methods, it goes into the peritoneal space by the structure of peritoneal anterior ring in the deeper transverse fascia, without opening the fascia. It ensures the better integrity of the transverse fascia, the lower the chance of hernia recurrence and the shorter operating time. Due to the stripping of the distal sac, the incidence of postoperative scrotal hematoma reduced significantly.

Inguinal hernia combined with cirrhotic ascites, which is considered as surgical contraindication. A study reported that we can place peritoneal dialysis catheter to control the abdominal pressure perioperation to achieving tension-free hernia repair, which can avoid ascites effusion, decrease abdominal pressure to make sure the healing of incision and reduce the incidence rate of hernia recurrence.⁶ In the recent 2 to 3 years, we choose preperitoneal tension-free hernioplasty by HST pathway, and put abdominal drainage tube in the operation, negative pressure suction device under the oblique muscles aponeurosis postoperative, achieving the same goal of reducing pressure.

Emergency preperitoneal incarcerated hernia tension-free repair in the person with cirrhotic ascites has not been reported. Our surgery is successful. We share our experience as follows.

Firstly, we put abdominal drainage tube in the operation, which achieve the goal of reducing abdominal pressure, as well as placing peritoneal dialysis catheter perioperation. What's more, it is beneficial to find if the content of incarcerated hernia is secondary necrosis and infection or intestinal fistula occurs. Secondly, we place negative pressure suction device under the incision postoperative to drain overflowing ascites and prevent fluid or blood effusion, which can guarantee the patch to fully mix with the organization. Location of negative pressure suction device should according to whether the distal hernia sac is stripped. If the distal sac is not complete stripped, such as transecting hernia sac, we suggest placing the negative pressure suction device in the distal scrotum. Otherwise, we suggest placing the device under the incision. To this, our personal view recommends stripping the distal scrotal sac to eliminate or reduce the occurrence of scrotum hematoma. In addition, we should keep the integrity of transverse fascia, which is important. We can open the hernia sac firstly and return the contents. Then, putting finger into the distal sac and using blunt and sharp instrument at the same time can completely free it from the fascia beneath easily. In this step, you should not destroy the original integrity of transverse fascia. When freeing the sac, the dead space is naturally closed, which can prevent the scrotum hematoma. Next, we suture the opened hernia sac. No matter how large the hernia sac, try not to reject it. And then, we fix the mid zone of the flat mesh on the top of hernia sac. Its aim is to ensure the sac not slide and maintain the integrity of the inner ring of the transverse fascia.⁷ We suture the crack of transversalis fascia and fix the leash on the transversalis fascia, which is good to make the hernia sac, mesh and crack of transverse fascia (peritoneal anterior ring) to be a whole structure. The structure increases the reliability of resisting ascites pressure. Moreover, because incarcerated hernia is difficult to ensure infection not occur, we recommend not to place the mesh when the surgeon has little experience. If the surgeon has to place mesh, he should wash the wound repeatedly with PVP to reduce the incidence of infection.⁸ For those high-risk patients with many complication, it is necessary to use antibiotics preventively in perioperation.

In a word, the HST pathway preperitoneal tension-free herniorrhaphy is worth learning and reference. It bases on the scientific anatomical theory, conforms to human physiological anatomy, and is beneficial to the integrity of ventral transverse fascia. Moreover, the new approach is easy to learn and the outcome of surgery is reliable. It is also adapted to incarcerated hernia combined with ascites. And it has some practical value.

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