CASE REPORT

Management of chylous ascites following laparoscopic presacral neurectomy

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Chylous ascites is an extremely rare complication of laparoscopic presacral neurectomy (LPSN), and treatment is still controversial. Four patients undergoing LPSN for dysmenorrhoea or chronic pelvic pain were complicated with chylous ascites. Two were successfully treated with bipolar cauterization and one, after the failure of initial treatment by bipolar cauterization, was then effectively managed by compression with Gelform and closure of the peritoneum of the presacral area by suture through laparoscopy. The fourth patient had persistent chyle leakage from the drainage tube after electrocauterization and was finally cured by conservative management including removal of the drainage tube and a low-fat diet for 3 weeks. Chylous ascites has not been reported in laparoscopic presacral neurectomy. Management that is quick, effective and subjects the patients to the least amount of suffering is still unresolved. Repeated laparoscopy can be considered to identify the possibility of injury to lymphatic vessels, to relieve abdominal distention due to chyle accumulation, and to apply electrocauterization or compression with Gelform and closure of the peritoneum. Conservative treatment with a low-fat diet may need a longer time. The use of a drainage tube may provide negative pressure allowing a continuous leakage of chyle. However, more controlled study is required to identify the most proper and effective management.

Key words: chylous ascites/dysmenorrhoea/electrocauterization/laparoscopic presacral neurectomy/low-fat diet

Introduction

Laparoscopic presacral neurectomy (LPSN) has been recognized to be an effective and safe method for the relief of dysmenorrhoea and chronic pelvic pain (Perez, 1990; Nezhat and Nezhat, 1992; Chen et al., 1996). An extremely rare complication of this operation is damage to the lymphatic vessels, leakage of chyle and the development of chylous ascites. Chylous ascites is defined as collection of chyle in the peritoneal cavity and is usually related to the extent of the surgery. Although chylous ascites has been reported in several invasive retroperitoneal surgeries (Pabst III et al., 1993; Dehart et al., 1994; Halachmi et al., 1995), it is still very rare and has not been reported as found after LPSN. This complication can be life-threatening and may have a relatively high mortality rate. It may be treated either conservatively or surgically. Herein we present our experience with four cases of chylous ascites after LPSN.

Case reports

Case 1

A 26 year old woman, gravida 1 and para 1, was admitted due to intractable dysmenorrhoea. Laparoscopy was performed and revealed mild endometriosis which was treated by cauterization. LPSN was also performed in the following procedure: identification of the aortic bifurcation, bilateral common iliac arteries, ureter on the right and inferior mesentery artery and superior haemorrhoidal vessels on the left were made; the peritoneum overlying the sacral promontory and 1 cm caudal to the aortic bifurcation was initially elevated and incised; then the underlying adipose tissue was grasped and bluntly dissected; nerve plexuses were then identified and freed from their underlying tissue from the left common iliac vein and middle sacral vein; the presacral nerves lying within the boundaries of the interiliac triangle were totally removed by unipolar and/or bipolar cauterization.

Unfortunately, persistent abdominal distention and tenderness were noted after the operation, but there was no fever or leukocytosis. Four days after the initial operation, ultrasound revealed an accumulation of fluid in the cul-de-sac. Milky fluid was easily aspirated by culdocentesis. Additional laparoscopy was immediately performed and revealed 250 ml chyle in the pelvic cavity. However, no marked damage of lymphatic vessels was noted, but there was a large amount of chyle over the presacral area. The excised edges of the presacral area were cauterized by bipolar forces. A drainage tube was placed in the pelvic cavity. After surgery, not only the symptoms and signs, but also the chylous discharge were completely relieved. The patient was discharged 2 days later and was well at the follow-up.

Case 2

A 30 year old, gravida 4, para 2 and abortus 2, patient visited our clinic due to chronic central pelvic pain which was not relieved despite long-term medication (>3 months). She was admitted to receive LPSN. LPSN procedure was the same as in case 1.
After surgery, the patient complained of progressive abdominal distention, tenderness and rebound pain, but did not present with fever or leukocytosis. Ultrasound revealed some fluid over the cul-de-sac area 3 days after laparoscopy. Milky fluid was found by culdocentesis. In addition to prophylactic antibiotics, a low-fat diet was administered. Seven days later, the abdominal discomfort was aggravated and a repeated ultrasound showed more ascites, therefore a second laparoscopy was suggested. This revealed 400 ml chyle in the abdomen. Again there was no definite damage to lymphatic vessels, only a dense milky material over the presacral area. The section edges of the presacral nerve were cauterized by bipolar forceps and a drainage tube was placed in the pelvic cavity. After the second laparoscopy, there was no further chyle leakage from the tube and the patient was discharged 4 days after the second laparoscopy.

**Case 3**
A 24 year old, gravida 0 patient was admitted due to suspected endometriosis and intractable dysmenorrhoea which could not be relieved by medication. She received operative laparoscopy which demonstrated mild endometriosis. In addition to electrocauterization of endometriosis, LPSN was also performed as in case 1.

After the procedure, the patient had progressive abdominal distention and diffused abdominal tenderness, and oedema of bilateral vulvas. Vital signs were stable and the laboratory data, including leukocyte and biochemical parameters, were within normal limits. Whitish chylous fluid was easily obtained by culdocentesis 5 days after surgery. A second-look laparoscopy was performed which showed 350 ml chyle in the abdomen. The section edge of the presacral area was again cauterized using bipolar forceps. After the second operation, the patient was treated with drainage and a low-fat diet for 10 days. Unfortunately, persistent lymph leakage was noted through the drainage tube. She then received a third laparoscopy which revealed some chyle remaining in the presacral area. The oozing presacral area was compressed with Gelform and a drainage tube was placed in the pelvic cavity. After the third surgery, the patient was treated with drainage and a low-fat diet for 10 days. Unfortunately, persistent lymph leakage was noted through the drainage tube. She then received a third laparoscopy which revealed some chyle remaining in the presacral area. The oozing presacral area was compressed with Gelform and a drainage tube was placed in the pelvic cavity. After the third surgery, the patient became well and no further chyle was noted. She was discharged 5 days after the third operation.

**Case 4**
A 36 year old, gravida 3, para 2 and abortion 1, woman had chronic low abdominal pain and intractable dysmenorrhoea which had been unresponsive to medical treatment for a long time (>3 months). Thus, she was admitted to receive laparoscopic evaluation and treatment. Laparoscopy revealed minimal endometriosis and mild pelvic adhesion which were managed by electrocauterization of endometriotic foci and lysis of adhesion. LPSN procedure was also performed as in case 1. The patient was discharged 2 days later.

The patient had persistent and progressive abdominal discomfort. Diffuse low abdominal tenderness and rebound pain and distention were noted 2 weeks after operation. Ultrasound revealed much fluid accumulating in the cul-de-sac. Milky lymphatic fluid was aspirated by culdocentesis. Immediately after surgery, the patient complained of progressive abdominal distention, tenderness and rebound pain, but did not present with fever or leukocytosis. Ultrasound revealed some fluid over the cul-de-sac area 3 days after laparoscopy. Milky fluid was found by culdocentesis. In addition to prophylactic antibiotics, a low-fat diet was administered. Seven days later, the abdominal discomfort was aggravated and a repeated ultrasound showed more ascites, therefore a second laparoscopy was suggested. This revealed 400 ml chyle in the abdomen. Again there was no definite damage to lymphatic vessels, only a dense milky material over the presacral area. The section edges of the presacral nerve were cauterized by bipolar forceps and a drainage tube was placed in the pelvic cavity. After the second laparoscopy, there was no further chyle leakage from the tube and the patient was discharged 4 days after the second laparoscopy.

**Case 3**
A 24 year old, gravida 0 patient was admitted due to suspected endometriosis and intractable dysmenorrhoea which could not be relieved by medication. She received operative laparoscopy which demonstrated mild endometriosis. In addition to electrocauterization of endometriosis, LPSN was also performed as in case 1.

After the procedure, the patient had progressive abdominal distention and diffused abdominal tenderness, and oedema of bilateral vulvas. Vital signs were stable and the laboratory data, including leukocyte and biochemical parameters, were within normal limits. Whitish chylous fluid was easily obtained by culdocentesis 5 days after surgery. A second-look laparoscopy was performed which showed 350 ml chyle in the abdomen. The section edge of the presacral area was again cauterized using bipolar forceps. After the second operation, the patient was treated with drainage and a low-fat diet for 10 days. Unfortunately, persistent lymph leakage was noted through the drainage tube. She then received a third laparoscopy which revealed some chyle remaining in the presacral area. The oozing presacral area was compressed with Gelform and a drainage tube was placed in the pelvic cavity. After the third surgery, the patient was treated with drainage and a low-fat diet for 10 days. Unfortunately, persistent lymph leakage was noted through the drainage tube. She then received a third laparoscopy which revealed some chyle remaining in the presacral area. The oozing presacral area was compressed with Gelform and a drainage tube was placed in the pelvic cavity. After the third surgery, the patient became well and no further chyle was noted. She was discharged 5 days after the third operation.

**Discussion**
The reported incidence of surgical complications to the lymphatics in retroperitoneal surgery appears to be low; however, the extensive retroperitoneal lymphatic plexus may be injured during dissection. Most lymphatic leakages usually close spontaneously without clinical complications. The risk of lymph leak with chylous ascites is usually associated with extensive surgery, including lymph node dissection, abdominal aortic surgery and spinal surgery (Pabst III et al., 1993; DeHart et al., 1994; Halachmi et al., 1995). From January 1991 to February 1997, 684 cases received LPSN due to various indications in our hospital and received follow-up after operation. There were four cases noted of chylous ascites. This is the first report of chylous ascites occurring in LPSN. The exact mechanism of this complication is unknown. The anatomy of the abdominal lymphatic system is quite variable (Nix et al., 1957; McVay, 1984). Classically, the lumbar lymph system consists of three major trunks: right and left trunks that drain the iliac and sacral nodes ascending parallel to the great vessels and the intestinal trunk that drains the gastrointestinal system. These three vessels coalesce at the level of first lumbar vertebra to form the cisterna chyli which continues as the thoracic duct to the left subclavian venous system. The cisterna chyli lies on the anterior aspect of the first or second lumbar vertebra on the right side of the aorta. However, McVay (1984) has described 16 distinct anatomic variants of the abdominal lymphatic plexus and cisterna chyli. Thus, laceration or transection of the major lymphatic trunks should still be considered, even though usually there is no large lymphatic vessel over the presacral area. Since these cases had only a several hundred millilitre loss of chyle and case 4 demonstrated a daily leakage of ~100–200 ml chyle from the drainage tube. However, the abdominal pain and distention were completely relieved and there was no fever, leukocytosis or other signs of infection. The drainage tube was removed 2 weeks later due to the possibility that negative pressure from the drainage tube was responsible for the persistent chyle leakage. She then remained on the controlled diet as above and received complete bed rest. One week later, no more fluid was noted in the pelvis by ultrasound examination. The patient felt well and was discharged.
Postoperative abdominal distention confirmed by ultrasound and culdoscopesis

\[ \downarrow \]
Laparoscopy (diagnostic and therapeutic)

\[ \downarrow \]
Resolution

\[ \downarrow \]
No improvement

\[ \downarrow \]
TPN (14 days)

\[ \downarrow \]
No improvement

\[ \downarrow \]
Exploratory laparotomy

\[ \downarrow \]
Resolving ascites

\[ \downarrow \]
Low-fat diet

\[ \downarrow \]
Resolution

Figure 1. Algorithm for treatment of chylous ascites after laparoscopic presacral neurctomy. TPN = total parenteral nutrition.

Thoracic duct or subclavian obstruction, or aneurysmal dilatation may also be possible predisposing factors. In the present cases, since the electrocauterization or direct compression of the presacral edge resolved the complication, injury to the lymphatic vessels due to blunt dissection seems to be the most probable factor.

To our knowledge, there are only two reports on LPSN (Perez, 1990; Nezhat, 1992) in addition to our previous study (Chen et al., 1996). Neither report (Perez, 1990; Nezhat and Nezhat, 1992) demonstrated the complication of chylous ascites. Nezhat and Nezhat (1992) used CO₂ laser to excise nerve fibres, bundles and sheaths. Three other methods were used to dissect the presacral nerve as demonstrated by Perez (1990): Nd:YAG laser, end-o-loop sutures and bipolar forceps. In the present study, blunt dissection was primarily performed by unipolar scissors except when using bipolar forceps to control bleeding. Since the nerve trunk may not have been completely cauterized or there was possible electric injury due to the usage of unipolar instruments, it may be that the occurrence of chylous ascites could be related to the use of unipolar dissection. However, since the incidence rate was very low (0.6%, four in 684 patients), it cannot be concluded that any specific method could prevent this type of complication. Whatever the methods used for LPSN, prevention of lymphatic complication includes avoiding lymphatic vessels if seen, attempting the repair or ligation of lymphatic leakage as discovered, and closing the peritoneum.

In addition to clinical symptoms and signs, i.e. abdominal distention and pain, and vomiting, the diagnosis of chylous ascites can be made with the use of ultrasound and culdoscopesis or paracentesis of the chylous fluid, which typically has a milky appearance, as was present in our cases. Although lymphangiography may provide a definite diagnosis, it is not obligatory.

Chylous ascites can lead to not only abdominal pain, vomiting, malnutrition and anorexia, but also life-threatening conditions such as sepsis, severe respiratory distress and death. Management options are either conservative or surgical, but both are still controversial. In general, recommended treatment includes drainage, a low-fat diet or total parenteral nutrition (TPN), surgical laparotomy for lymph vessel ligation or peritoneovenous shunt for unresolved cases (Miedema et al., 1978; Halachmi et al., 1995). Pabst III et al. (1993) reported that the mortality rate in 27 cases of chylous ascites after aortic surgery was 18.5% and four deaths occurred in the medically treated group. Nevertheless, they recommended that surgery to close the lymph fistula should be reserved for those patients in whom conservative therapy with medium-chain triglyceride (MCT) diets or TPN has failed. MCT are employed since only long-chain triglycerides use the lymphatic ducts. In cases 2, 3 and 4, the conservative treatment with a low-fat diet with and without drainage did not seem to be effective and would have required a longer term of admission. However, we cannot deny that our time span for conservative management may not have been long enough (7–14 days), as Pabst III et al. (1993) reported the time from initial operation to complete resolution ranged from 10 to 146 days (mean: 63 days) in patients developing chyloperitoneum after abdominal aortic surgery. Conservative treatment using only a low-fat diet may not be aggressive enough. Pabst III et al. (1993) reviewed the management of chyloperitoneum after aortic surgery in 19 reports in which diet therapy with high-protein, low-fat, and MCT was used in 20 patients and only two patients had resolution through diet therapy alone. In contrast, TPN therapy alone or in conjunction with diet and/or paracentesis resolved the chylous ascites in nine of 15 patients. Since laparoscopy is a very common and safe surgery at present, immediate laparoscopy may not only provide immediate relief of abdominal discomfort, but also allow the vital evaluation of existing conditions, such as excluding injury of the large lymphatic vessels or other vital organs. Furthermore, management with electrocauterization or compression through laparoscopy may also achieve immediate resolution. There may have been injury to the deep lymphatic plexus which resulted in the failure of electrocauterization in cases 3 and 4. The failure of compression with Gelform in case 4 may be related to the incomplete effect of compression due to the failure to close the peritoneum. In case 4, it seems that usage of a drainage tube was not suitable.
management, since the effects of negative pressure may have not only decreased the effects of compression but also accelerated the leakage of chyle. Since we have had success in treating chyloous ascites with the surgical method, immediate laparoscopy may be considered in chyloous ascites due to LPSN. From our experience with these four cases and review of management in other reports (Pabst III et al., 1993; DeHart et al., 1994; Halachmi et al., 1995), we devised the treatment algorithm shown in Figure 1. Initial treatment with laparoscopy locates the active lesion and relieves abdominal distention. Through the laparoscopy, repair or ligation of lymphatic leaks can take place. Also electrocauterization and/or compression with Gelform and the closure of the peritoneum to combat slow lymph leakage from presacral area, as was done in the present cases, can then be performed. Use of a drainage tube is not recommended. If persistent leakage of chyle is noted by ultrasound and culdocentesis, treatment with TPN continues for at least 2 weeks, then is changed into a low-fat diet till complete resolution of chyloous ascites. If there is no improvement with TPN, abdominal exploration with either closure of the lesions or peritoneovenous shunting should be attempted. However, chyloous ascites induced by other operations may require different forms of medical management. It is also our opinion that more controlled studies are needed to prove the efficacy and propriety of the recommended treatment.

References


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