CHYLOPERITONEUM : AN UNUSUAL COMPLICATION OF ANTERIOR LUMBAR INTERBODY FUSION

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ABSTRACT:

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Chyloretroperitoneum as a complication of anterior lumbar interbody fusion is described in case of tuberculous spondylitis. Metabolic complication developed after treatment with total parenteral nutrition therapy when chyloperitoneum was noted. The surgical exploration was performed to control the chyle extravasation by suture ligation.

Anterior surgical approaches to the spine, popularized by Hodgson and Stock in the 1960, are now in common usage by surgeons treating a variety of complex spinal diseases and spinal deformities. Although numerous postoperative complications have been described, there has been only one case of chyloretroperitoneum reported in the English literature[1]. Resulting from the anterior approach for spinal fusion. We report a patient who developed chyloperitoneum three days following a single level anterior lumbar interbody fusion.

Case Report

P.C. a 59 years old male,an alcoholic patient with cirrhosis, presented with 6 months history of low back pain. The pain was localized at the level of the second lumbar vertebra. He complained of pain at rest, which was aggravated by activities. Examination showed an old man with mild icteric sclera. There was tenderness at the second lumbar vertebra and pain on flexion and extension. Neurological examination was normal. The roentgenographic exam showed an osteolytic lesion at lower border of L_2 and upper border of L_3 vertebra with narrowing disc space between L_2 - L_3. The pedicles are intaced. No definite paravertebral soft tissue swelling. The study suggested tuberculuous spondylitis. (Figure 1) In June 1994, an anterior disc and necrotic bones were removed and interbody spine fusion at the L_2 - L_3 vertebra level was performed. (Figure 2) As the lymph nodes around the L_2 - L_3 vertebra weas biopsied, a small amount of creamy fluid was noted to be present. This area was cauterized.

At the time of closure, 2 penrose drain were placed for drainage which appeared to be normal in amount and colour (serosanguinous). On the third postoperative day, after the regular diet was taken by the patient, the drainage became creamy, an amount of 1500 ml over a twenty four hour period, and became clear after the patient was fed nothing by mouth for three days along with the total parenteral nutrition therapy was started. But the drainage still persisted with the average amount between 500 - 800 ml per day. On the tenth postoperative day, the patient had some abdominal discomfort, retractable hypoglycemia despite of treatment with 10% dextrose in saline and 50% glucose push in

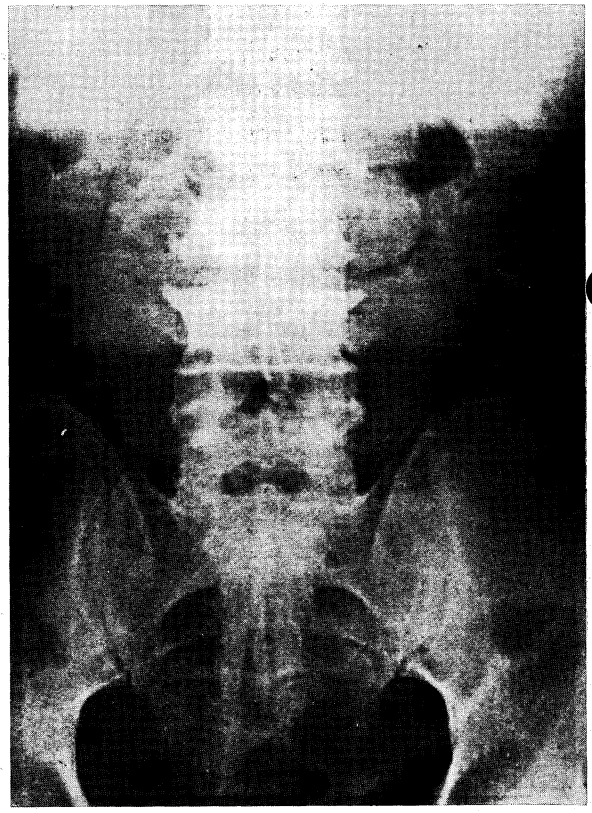

Fig. 1 Preop. Roentgenographic : Osteomyelitis lesion at lumber 2-3 vertebra.

Fig. 2 Postop. Roentgenographic : Black arrow point at iliac bone graft for fusion, open arrow point at 2 penrose drains.

multiple bolus doses. The jaundice began to develop, the twenty hour urine volume decreased to below 500 ml and the conscious became drowsy in spite of full medical conservative treatment. The reexploration was done and the finding was chylous leakage from the tributaries of the cisterna chyli. Many 3.0 dexon suture ligature were placed in a figure eight manner in the tissue from which the Chyle was leaking. No further expression of fluid was noted at the end of the operation. Unfortunately, on the twenty third postoperative day the patient developed marked jaundice and acute renal shutdown that rapidly progress to fatal

Discussion

Chyle is an odorless, sterile, bacteriostatic, alkaline milky white and opaque fluid which transported ingested fat. The total protein content varied from 2.5 - 8 G/100 ml, Specific gravity between 1.010 - 1.030, total lipid 900 - 3000 mg/dl, lymphocyte 400 - 6800 cells and RBC 50 - 600 cells per ml. The fat globule can be detected with sudan 3 strain.[1-7]

Chylous leakage has been reported after almost every kind of thoracic[3] and retroperitoneal operation[5,8] but it is still an unusual complication of anterior spinal arthrodesis. This leakage can occur as a result of disruption of the thoracic duct, the cisterna chyli, or the retroperitoneal lymphatic trunks.[1]

The lymphatics of the lower limbs, pelvis, and abdomen flow cephalad to the cisterna chyli by way of the lumbar lymphatic trunks and intestinal trunk. There may be many variations in the normal anatomy of the lymphatic drainage. The cisterna chyli is a saccular dilatation, which may be present anterior to the first or second lumbar vertebra. Just before it reaches the diaphragm, it narrows to become the thoracic duct, and this ascends through the esophageal hiatus of the diaphragm, outside the pleura and along the anterior surface of the vertebral column, to the fifth thoracic vertebra,there it crosses from right to left, and its contents flow into one of the major veins at the junction of the left subclavian and internal jugular veins. The transport of fat from the gastrointestinal tract is the principal function of this system. About 60 to 70 percent of absorbed fat passes into the lymphatics rather than the bloodstream.[8]

Even with the increasing frequency of anterior spinal arthrodesis and retroperitoneal operations,[9] the cisterna chyli is seldom seen by the surgeon, as only 50 percent of patient have a discrete cisterna.[2, 7, 10] Propst - Proctor et al. surveyed ten spinal surgeons to determine the frequency with which these structures were seen and what complications were encountered. More than 1,ooo anterior spinal approaches were included in the survey, but none of the surgeons consistently identified the cisterna or the thoracic duct. The structures were observed twelve times and chylothorax was encountered on three occasions.[9] We believe, however, that if time and care are taken, the cisterna can be observed if present.

Treament of patients who have chylous leakage should be directed toward a decrease of chylous leakage and adeqate supportive therapy. There are several methods of treatment consisted of conservative treatment,[1, 2, 5, 6, 8, 12] serial paracentesis with[5, 9] or without reinfusion, sclerosing therapy[3] and surgical exploration.[7, 10]

The conservative treatment aims to decrease in the formation of chyle through a low fat diet, drainage of the fluid and adequate supportive therapy.

The rate of transport of chyle has been shown to be dramatically affected by the amount of fat, particularly long - chain triglycerides in the diet, and medium - chain triglyerides are not transported in the lymphatics but are directly absorbed into the bloodstream (resulting in less production of chyle)[8]. Therefore, a diet that is low in fat content, with the fat consisting of medium - chain triglycerides, has been recommended by some in the hope of maintaining balanced nutrition while decreasing the formation of chyle.[1, 6, 8, 11, 12] But the total parenteral nutrition offers advantages over the dietary approach. Adequate caloric intake can be measured. Moreover, placing the gastrointestinal tract at complete rest offers a means of decreasing chyle formation while hopefully allowing closure of the leakage and it has been suggested that parenteral nutrition be continued for at least one month.[11] Almost literatures have used this form of treatment[1, 2, 6, 7, 11, 12] with successful and have the same opinion that the conservative measure should be the treatment of choice unless there are special indications that other forms of treatment should be selected.

A second form of treatment, intravenous reinfusion of chylous material obtained by paracentesis has been used recently with success but fat embolism may be a complication of this technique, so reinfusion in regarded as a significantly hazardous form of treatment.[5, 9]

Cepedese and Peretsman described using talc and tetracycline in sclerotherapy of retroperitoneum which appeared to be helpful as previously described in treatment of a primary chylothorax.[3]

Surgical intervention is usually indicated if average chyle loss is greater than 1500 cc per day for more than 5 days in adults or greater that 100 cc per day for more than 5 day in children, chyle flow has not diminished after 14 days of dietary or total parenteral nutrition therapy, or metabolic or nutritional complications occur.[3]

In our patient. because of poor physical status, underying cirrhosis, we performed surgery after ten

days of chylous leakage. The intraoperative finding was the chylous leakage from the rents to the tributaries of the cisterna chyli (left lumbar trunk) as the lymph node biopsies were done in order to confirm the diagnosis of tuberculous spondylitis.

Unless the operation to stop chylous leakage was succussful but the patient still died on the twenty - third postoperative day after he had developed a complication of the hepatorenal syndrome, one week postoperatively. The symptoms were consisted of severe jaundice, acute renal shutdown and deterioration of consciousness. Compared with Vasko & Tapper reported a 43 percent mortality rate in adult and a 24 percent mortality rate in chidren.[14]

Conclusion

When using the anterior surgical approach to the spine, the orthopaedic surgeon must be aware of the anatomy of the prevertebral lymphatics and of the possibility of damage and consequent leakage of chyle. Although this report describes experience with only one patient, we believed that it will be of help to others encountering this condition.

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