

Case Report

The superior mesenteric artery syndrome : a rare complication after post-traumatic spine surgery.

ABSTRACT:

Superior mesenteric artery syndrome is a rare complication occurring post traumatic spin surgery. it causes vertical traction on the superior meseteric artery and closure of the angle, which causes compression of the third duodenum causing the syndrome. We report the case of a young patient victim of a road accident having caused dorsolumbar trauma, the CT scan had shown comminuted fractures in the dorsolumbar vertebrae. The patient had undergone an osteosynthesis. On day 3 postoperatively, patient had experienced vomiting. Urgent abdominal CT scan was performed which allowed the diagnosis of superior mesenteric artery syndrome, showing an important gastric dilatation associated with complete halt of the third part of the duodenum. Treatment consisted in the rest of the digestive tract associated with early parenteral nutrition and correction of fluid and electrolyte imbalances. Lacking evidence of clinical improvement, surgical indication was posed. patient having undergone gastrojejunal bypass The evolution was favourable with an uneventful postoperative recovery and the resumption of adequate food intake on the fourth postoperative day. The patient was discharged on the seventh postoperative day. The treatment is multidisciplinary, medical (first-line treatment) and surgical (if medical treatment do not help).

Key words: Superior mesenteric artery, duodenal obstruction, post traumatic spin surgery

Introduction :

The superior mesenteric artery syndrome or SPAM is a rare syndrome due to the compression of the 3rd duodenum by a vascular clamp formed by the superior mesenteric artery and the aorta, forming an angle of closure(1). This syndrome can be secondary to several surgical circumstances such as a correction of a spinal deformity (dorsal kyphosis, scoliosis) or post-traumatic surgery of the dorsal spine, as it can be secondary to medical circumstances (anorexia nervosa, extensive burns, sd of malabsorption)(2). We report an early case of mesenteric artery syndrome following post-traumatic dorsolumbar spine surgery. A review of the literature allowed us to optimize management.

Case Présentation:

The patient is 24 years old, unmarried, without profession, without any particular pathological history , victim of a public road accident, causing him a traumatism of the dorsal rachis, at the clinical examination: paraplegic patient, holds the bar, does not hold the mangazini, spinal syndrome at the positive dorsal level, soft abdomen.

In dorsolumbar CT: communicating fracture of the vertebral body and the posterior arch of D10 with posterior wall recoil and intracanal fragment with another fragment facing the transverse process of D11. Communicative fracture of the vertebral body of L1 with posterior

wall recoil and displacement of a fragment at the medullary canal. Fracture of the left transverse process of L2. Right spinal costo-dislocation of D11 (figure 1).

Patient with osteosynthesis fixation (10 screws) (figure 2). Postoperative follow up were marked at d3 by the appearance of postprandial vomiting with abdominal pain. On abdominal examination there was moderate abdominal distension with lapping on an empty stomach. An abdominal CT scan was performed, had shown significant gastric and duodenal distension (D1 and D2) upstream of a transitional zone located at D3 passing between the aorta and the superior mesenteric artery with an estimated aorto-mesenteric angle of 11° (figure 3). Pancreas of normal size at the level of these different portions repressed by gastric distension without any noticeable defect of enhancement. Biological exams had shown, an hyponatraemia about 126 mEq/l, a kalaemia of 3.5 mEq/l, and a correct renal assessment. A medical treatment of conditioning, with a nasogastric aspiration and correction of the internal balance sheet were required. Patient had benefited from a sub-mesocolic gastrojejunal bypass in anisoperistaltic omega anisopéristaltic omega with jejunio-jejunal anastomosis at the foot of the loop. The postoperative sequelae were simple with disappearance of vomiting, transit resumed at d3 postoperatively. The patient was declared outgoing at d7 postoperatively with a correct biological check-up.

Discussion:

Vascular compression of the duodenum was first described by Rokitansky in 1842, the first successful surgical procedure (duodenojejunoscopy) was performed by Staveland in 1908(3,4). Upper mesenteric artery syndrome (UMA), also known as Wilkie's syndrome, is a rare cause of upper obstruction. Its exact incidence is unknown. It is caused by a reduction in the aortomesenteric angle(5,6), which can range from 6 to 15° . Several studies have found a frequency of aorto-mesenteric clip syndrome of 1% after spinal surgery [7], apart from scoliosis correction which varies from 0.5 to 4.7% (8).

The importance of the morphotype is identified as a risk factor for the occurrence of this syndrome. According to Shah et al., the taller and thinner the subjects are, the more likely they are to close their aorto-mesenteric clamp after posterior surgical correction or plaster [9]. In the literature, the symptoms of this condition occur late, within a week after surgery. In our patient, the onset of signs of high occlusion was particularly early on the third day. The aggravation of vomiting episodes and the appearance of abdominal distension beyond 72 hours should be investigated, especially in subjects at risk. The abdominal CT scan provides a diagnosis in relation to water-soluble transit, which is often poorly tolerated by the patient. The diagnosis is also confirmed by the measurement of the angle of the clamp on the scanner images with injection of contrast product. According to the literature, this angle is normally between 45° and 60° , whereas in the case of aorto-mesenteric forceps syndrome, the angle closes to between 6° and 15° [1,10,11]. Oesophageal fibroscopy is useful to eliminate an intraluminal gastric obstacle, shows extrinsic compression and its location in the third duodenum.

Angiography is useful to measure the vascular angle and to determine the indication for possible surgical treatment(12). Studies suggest that medical treatment is recommended first. It consists of resting the gastrointestinal tract in combination with parenteral nutrition and correction of fluid and electrolyte disorders for several weeks [2,10]. This therapeutic option aims at a weight gain for the patient, favorable to an increase in retroperitoneal fat around the mesenteric artery in order to open the angle of the forceps until the symptoms disappear [13,14]. However, many complications inherent to artificial nutrition in the long term (thrombotic, infectious, hydro-electrolytic etc) cannot be spared. At present, medical treatment is more and more recommended [15,16,17], although it increases the cost and length of hospitalization. Its effectiveness has been reported by Altiok et al in a series of 17 cases, only one of which required surgical treatment(15) . In our case, surgery was considered necessary because of hydroelectrolytic disorders. According to Kadji et al, surgical treatment is necessary in 75% of cases [14]. The surgical options to be considered are lysis of the Treitz ligament, gastrojejunostomy and duodenojejunostomy. Recently, a laparoscopic approach has also been reported [18, 19, 20-21]. In 1927, Wilkie concluded that duodenojejunostomy was the treatment of choice [22]. In 2015, researchers at Cleveland Clinic reported the results of the largest series of patients who underwent minimally invasive duodenojejunostomy for Superior mesenteric artery syndrome , where all patients experienced symptomatic improvement immediately after surgery [23]. The medical treatment is of great interest in the pre-surgical preparation in our case. Our patient benefited from a gastrojejunostomy at d3 of symptomatology with good clinical and biological improvement.

Conclusion:

Superior mesenteric artery syndrome is a rare complication of traumatic spine surgery. The diagnosis is suspected in the face of persistent late postoperative vomiting, usually lasting more than a week, although the onset may be early. Abdominal CT scans are useful for early diagnosis, showing significant gastric dilatation with a definite stop in the third duodenum. The treatment is multidisciplinary (anesthesiologist, digestive surgeon, radiologist). The prognosis is generally favourable subject to rapid medical and surgical management.

References :

1. WELSCH, Thilo, BÜCHLER, Markus W., et KIENLE, Peter. Recalling superior mesenteric artery syndrome. *Digestive surgery*, 2007, vol. 24, no 3, p. 149-156.
2. TRAORE, Mamadou Mour, LEYE, Pape Alassane, BAH, Mamadou Diawo, et al. Early form of Wilkie's syndrome: a rare complication of scoliosis surgery, about a case and review of the literature. *The Pan African medical journal*, 2016, vol. 25, p. 90-90.
3. VON ROKITANSKY, Carl. *Handbuch der pathologischen Anatomie: Handbuch der speciellen pathologischen Anatomie*; 2. Braumüller & Seidel, 1842.
4. STAVELY, A. L. Acute and chronic gastromesenteric ileus with cure in a chronic case by duodenojejunostomy. *Bull Johns Hopkins Hosp*, 1908, vol. 19, p. 252.
5. SALEM, Ali, AL OZAIBI, Labib, NASSIF, Suad Mohamed Maher, et al. Superior mesenteric artery syndrome: A diagnosis to be kept in mind (Case report and literature review). *International journal of surgery case reports*, 2017, vol. 34, p. 84-86.
6. MANSBERGER, Arlie R., HEARN, John B., BYERS, Robert M., et al. Vascular compression of the duodenum: emphasis on accurate diagnosis. *The American Journal of Surgery*, 1968, vol. 115, no 1, p. 89-96.
7. ZADEGAN, F., LENOIR, T., DRAIN, O., et al. Syndrome de la pince aorto-mésentérique après correction d'une déformation rachidienne: À propos d'un cas et revue de la littérature. *Revue de chirurgie orthopédique et réparatrice de l'appareil moteur*, 2007, vol. 93, no 2, p. 181-185.
8. TSIRIKOS, Athanasios I., ANAKWE, Raymond E., et BAKER, Alexander DL. Late presentation of superior mesenteric artery syndrome following scoliosis surgery: a case report. *Journal of medical case reports*, 2008, vol. 2, no 1, p. 9.
9. SHAH, Munir A., ALBRIGHT, Maurice B., VOGT, Molly T., et al. Superior mesenteric artery syndrome in scoliosis surgery: weight percentile for height as an indicator of risk. *Journal of Pediatric Orthopaedics*, 2003, vol. 23, no 5, p. 665-668.
10. OOI, G. C., CHAN, K. L., KO, K. F., et al. Computed tomography of the superior mesenteric artery syndrome. *Clinical imaging*, 1997, vol. 21, no 3, p. 210-212.
11. FALL, Mbaye, BÂ, Papa Abdoulaye, TOURÉ, Fodé Baba, et al. Le syndrome de la pince aorto-mésentérique chez l'enfant: à propos d'un cas primitive. *The Pan African Medical Journal*, 2014, vol. 19.

12. WELSCH, Thilo, BÜCHLER, Markus W., et KIENLE, Peter. Recalling superior mesenteric artery syndrome. *Digestive surgery*, 2007, vol. 24, no 3, p. 149-156.
13. LOEB, T., LOUBERT, G., MORSLY, R., et al. Syndrome de l'artère mésentérique supérieure. In : *Annales françaises d'anesthésie et de réanimation*. Elsevier Masson, 1999. p. 1000-1004.
14. KADJI, M., NAOURI, A., et BERNARD, P. Syndrome de la pince aortomésentérique: à propos d'un cas. In : *Annales de chirurgie*. Elsevier Masson, 2006. p. 389-392.
15. WALKER, Charles et KAHANOVITZ, Neil. Recurrent superior mesenteric artery syndrome complicating staged reconstructive spinal surgery: alternative methods of conservative treatment. *Journal of pediatric orthopedics*, 1983, vol. 3, no 1, p. 77-80.
16. ADSON, David E., MITCHELL, James E., et TRENKNER, Stephen W. The superior mesenteric artery syndrome and acute gastric dilatation in eating disorders: a report of two cases and a review of the literature. *International Journal of Eating Disorders*, 1997, vol. 21, no 2, p. 103-114.
17. HUTCHINSON, Douglas T. et BASSETT, GEORGE S. Superior mesenteric artery syndrome in pediatric orthopedic patients. *Clinical orthopaedics and related research*, 1990, no 250, p. 250-257.
18. POTTORF, Brian J., HUSAIN, Farah A., HOLLIS, H. Whitton, et al. Laparoscopic management of duodenal obstruction resulting from superior mesenteric artery syndrome. *JAMA surgery*, 2014, vol. 149, no 12, p. 1319-1322.
19. SUN, Zhuo, RODRIGUEZ, John, MCMICHAEL, John, et al. Minimally invasive duodenojejunostomy for superior mesenteric artery syndrome: a case series and review of the literature. *Surgical endoscopy*, 2015, vol. 29, no 5, p. 1137-1144.
20. SHINJI, Seiichi, MATSUMOTO, Satoshi, KAN, Hayato, et al. Superior mesenteric artery syndrome treated with single-incision laparoscopy-assisted duodenojejunostomy. *Asian journal of endoscopic surgery*, 2015, vol. 8, no 1, p. 67-70.
21. KIRBY, G. C., FAULCONER, E. R., ROBINSON, S. J., et al. Superior mesenteric artery syndrome: a single centre experience of laparoscopic duodenojejunostomy as the operation of choice. *The Annals of The Royal College of Surgeons of England*, 2017, vol. 99, no 6, p. 472-475.
22. WILKIE, B. P. Chronic duodenal ileus. *Am J Med Sci*, 1927, vol. 173, p. 643-650.
23. SUN, Zhuo, RODRIGUEZ, John, MCMICHAEL, John, et al. Minimally invasive duodenojejunostomy for superior mesenteric artery syndrome: a case series and review of the literature. *Surgical endoscopy*, 2015, vol. 29, no 5, p. 1137-1144.

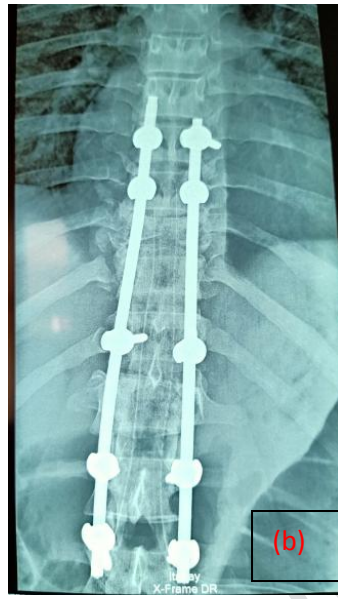


figure1: communal fractures of the Dorsolumbar Spine before (a) and after (b) placement of osteosynthesis material

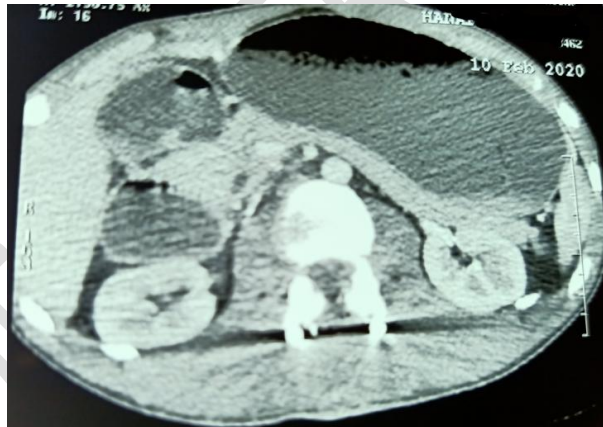


figure 2: scan section showing gastric and duodenal dilatation