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SUPERIOR MESENTERIC ARTERY SYNDROME COMPLICATING TREATMENT WITH BALANCED TRACTION

A Case Report

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A brief review of the superior mesenteric artery syndrome is given. A case is reported which occurred after 9 weeks of treatment of a fractured femur by continuous traction with balanced suspension. The condition was successfully treated by conservative measures including a plaster hip spica allowing frequent changes of position. The importance of early diagnosis and prompt treatment is emphasized.

Key words: mesenteric artery syndrome; fracture of the femur; balanced traction; duodenal obstruction; complication to treatment

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Compression of the duodenum by the superior mesenteric artery is most often called the superior mesenteric artery syndrome. Other names, e.g., arteriomesenteric ileus and Wilkies' disease, are used as well. In orthopaedic practice the syndrome is most well-known as "the cast syndrome" as it may follow body cast application, for example, in the treatment of scoliosis (Dorph 1950, Bunch & Delaney 1970, Soreff 1973, Warner et al. 1974, Bisla & Louis 1975 and others).

The syndrome can also appear during prolonged bed rest in the supine position, as in the treatment of fractures by continuous traction with balanced suspension. A case of this type is reported.

CASE REPORT

An 18-year-old man of asthenic habitus with no earlier gastro-intestinal symptoms sustained a fracture of the shaft of the left femur and a fracture of the right radius, but no abdominal lesions. The fracture of the femur was treated by continuous traction with balanced suspension (Figure 1). After 9 weeks of immobilization in the supine position, the patient developed symptoms and signs of a high ileus. Radiographic examination (Figure 2) revealed a compression occlusion of the distal part of the duodenum. The condition was recognized as the superior mesenteric artery syndrome and it was decided to treat the patient conservatively with gastric suction and parenteral nutrition. The dehydration, alkalosis and hypokalaemia were corrected. The balanced suspension was removed, and a plaster hip spica was applied to permit frequent changes of the position of the patient. This treatment was successful and the symptoms and signs of ileus disappeared in a couple of days. The symptoms returned to a lesser degree 4 weeks later when the patient still had not been mobilized with his plaster hip spica and the changing of position was not so frequent. Again the symptoms soon disappeared by applying the same conservative treatment as before. Thereafter the patient was mobilized in his plaster hip spica with a pair of crutches and treatment was continued on an outpatient basis. Since that time there have not been any gastro-

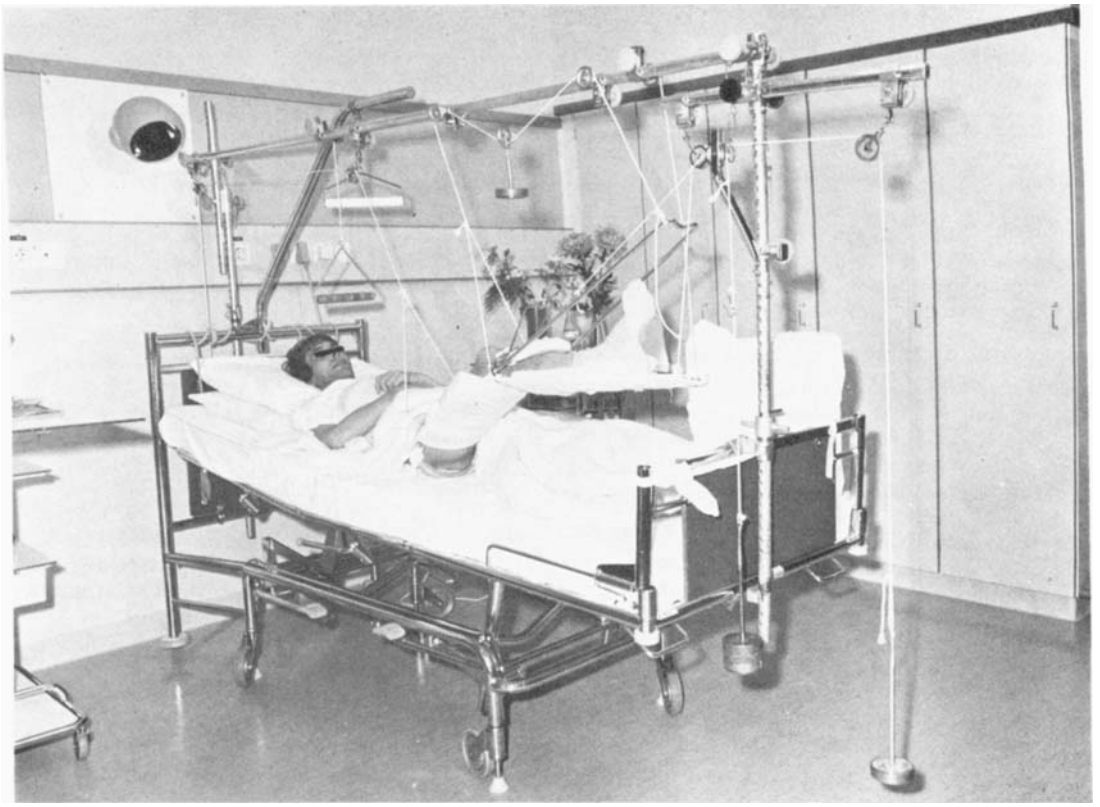

Figure 1. Sustained traction with balanced suspension as used in the case described. The patient shown is not the one reported.

intestinal problems. The exact change of his weight from before the accident until the beginning of his ileus is not known, but there was a considerable weight loss.

DISCUSSION

The superior mesenteric artery syndrome is a vascular compression obstruction of the duodenum, the transverse portion of which is the most fixed part of the alimentary tract, placed retroperitoneally between the aorta and the vertebrae posteriorly and the root of the mesentery of the small bowel anteriorly. Here it is placed like a nut between the jaws of a nutcracker, with a movable anterior and an immobile posterior jaw. When the distance between the "jaws" becomes too narrow duodenal compression occurs. The anatomic basis of this vascular compression of the duodenum is further described by Akin et al. (1974).

Several causes have been given, and some of these are:

1. Marked rapid loss of weight including loss of the retroperitoneal fat, so that the superior mesenteric artery impinges more directly on the duodenum.
2. Prolonged bed rest in the supine position.
3. Asthenic habitus.
4. Increased lumbar lordosis and decrease in the scoliosis angle.
5. Weak abdominal musculature.
6. Prolonged abdominal compression, e.g., by plaster body cast.

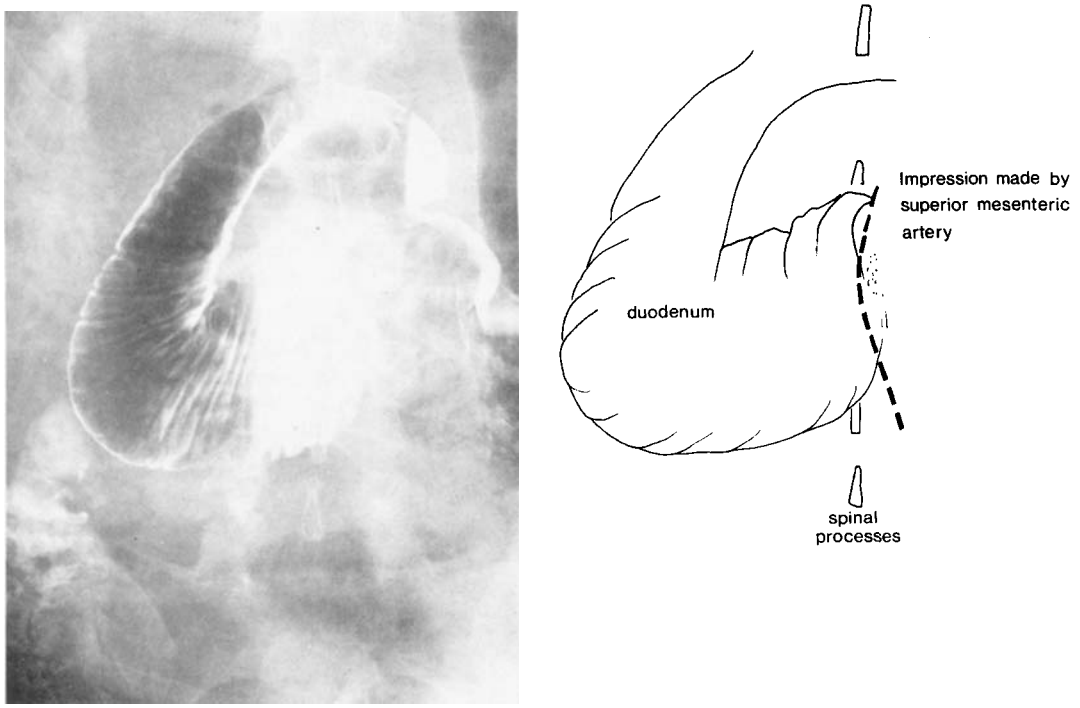

Figure 2. The radiographic findings leading to the diagnosis. A compression at the distal part of the duodenum (AP-projection, the patient in the supine position).

Several of the factors are often involved in the development of the syndrome.

Three categories of the superior mesenteric artery syndrome can be distinguished. Firstly, there is a group of patients who after, for example, a scoliosis operation and immobilization in a body cast or plaster hip spica rapidly (in a few days) develop the type of the superior mesenteric artery syndrome described as the cast syndrome. The second group includes patients with severe war injuries (Wayne et al. 1971) and patients with severe burn injuries (Rechler et al. 1972). Characteristic for the patients described by Wayne and Rechler is prolonged bed rest in the supine position with loss of weight followed by the superior mesenteric artery syndrome after 10 to 97 days. Patients with a more chronic and intermittent version of the syndrome constitute the third group (Jones et al. 1960).

The clinical picture of the acute syndrome is that of high intestinal obstruction with gastric dilatation and vomiting of bile-stained material. In the less acute form there is postprandial epigastric fullness with epigastric pain or vague and ill-defined epigastric discomfort after eating. This may be associated with anorexia, malaise, nervousness, easy fatigability, marked mental depression and emotional instability. If not treated the pernicious vomiting may lead to hypovolaemia, alkalosis, hypokalaemia and to shock and death.

The diagnosis should be confirmed by radiologic examination. Under fluoroscopy with the patient in different positions the occlusion can be seen to diminish to a greater or lesser extent in some positions, a fact which can be used therapeutically. These observations under fluoroscopy also prove that the superior mesenteric artery syndrome is a reality.

This has been questioned by Cimmino (1961) and others.

As soon as the diagnosis is established, prompt treatment including gastric suction, parenteral nutrition and correction of hypovolaemia and hypokalaemia should be started. If possible the position of the patient should be changed frequently. If the symptoms persist for more than 24 hours, casts and plasters should be removed. If this treatment is impossible or unsuccessful, surgical intervention is indicated.

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