A case of inguinal hernia stone alongwith diabetes and pathophysiology

Un cas inhabituel de hernie inguinale

Inguinal hernia is a common entity in the world which may contain the omentum or small bowel as contents. Hernia defined as the protrusion of a viscus or part of a viscus through the wall of the cavity that normally contains it. Mazdak et al. [1] reported the first case of stone in the inguinal hernial sac (hernial sac lithiasis), we also came across with similar case as reporting. We would like to coin the term herniolithiasis (hernia + lithiasis [HL]) defined as a stone found in the hernia sac. Hernia sometimes gives surprise to surgeons due to its unexpected findings. There are certain other conditions which give surprise to surgeons. Singal et al. [2] reported three cases of Amyand’s hernia with different contents as appendix and colon (inguinal and incisional hernia). X-ray, ultrasonography (USG) and computed tomography (CT) are the useful investigations to make the diagnosis e.g. in obstructed hernia, epiploic appendagitis (EA)/stone etc. or to rule out other abdominal pathology. But these are not routine tests in inguinal hernial cases [3].

Case report

A 50-year-old non-Caucasian man was referred to us for umbilical and right inguinal hernia surgery. These were present since 4 years. He was known non-insulin dependent diabetic and hypertensive since 20 years. Patient was admitted in the department of Medicine for uncontrolled blood glucose levels (> 450 mg/dl) and blood pressure (170/100 mmHg). He was chronic smoker (used to smoke six cigarettes per day) since 20 years and also consumed alcohol for the last 38 years. There was history of only one episode of severe groin pain 8 months back which was severe in nature. He took only analgesics for 2 days and got relieved. There was no history any kind of abdominal surgery e.g. cholecystectomy.

On examination, vital signs were stable. A swelling was present in the right inguinal region which was extending to the base of the scrotum. The cough impulse was present. Swelling was reducible in lying down position. The provisional diagnosis was made as non-obstructed reducible umbilical and right inguinal hernia with diabetes mellitus and hypertension.

Routine blood tests were within normal limits. Blood glucose levels were under control with medication and fitness was taken for surgery. A skin crease incision was given over the right inguinal region. The external oblique incised, the cord identified and the hernial sac was opened. The contents were small bowel loops and incidentally we found a single stone in the fundus of the inguinal hernial sac (figure 1). The stone was loosely adherent to the sac. After removing the stone, hernial contents reduced and the sac was transfixed with 2-0 vicryl (ethicon). Following this, a standard Lichtenstein mesh repair was done. Injection third generation antibiotic and amikacin was given for two days and later he was put on oral antibiotics for another 3 days. The patient was discharged in a satisfactory condition on 4th postoperative day. Postoperative X-ray, USG of the abdomen and scrotum were normal. In follow-up period of 2 months, the patient remained asymptomatic without any recurrence.

Stone was sent for biochemical analysis. On examination, it was pale yellow in color, of size 1.25 cm, oval in shape, with a smooth outer surface and was uniform, pale yellow centre on cut surface. The stone contains calcium (60%) and phosphate (40%) to be the principal constituents without any amounts of oxalate, urate and cholesterol. X-ray of the stone showed radiopaque shadow.

Discussion

A calculus is a stone or a concretion of material that forms in an organ or duct of the body. Calculi usually are asymptomatic and may be first encounter during the surgery for unrelated conditions. Inguinal hernia sometimes gives surprise to skilled surgeons due to its unusual contents. The most common sites for stone occurrence are the urinary bladder, biliary tree, salivary glands, intestines and the venous system. Its presence is rare in the breast, nasal cavity and peritoneal cavity.

A very uncommon site for stone formation is in the inguinal hernia sac (HL), as seen in our reporting case. Hernial stones can occur as: extrasaccular defined as; the stone located outside of the sac but within the hernial defect; or intersaccular – the stone present within the sac. Pathophysiology, chronic infection/irritation or inflammation may cause fibrosis and calcification of the fatty tissue. It can lead to stone formation in an uncontrolled diabetic patient as seen in our case and varies. Torsion of the EA leads to ischemia, followed by inflammation, saponification, calcification and fibrosis. It causes atrophy of the pedicle, finally amputation and progressive to formation of free peritoneal body [4].

References

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2. Singal et al. [2] reported three cases of Amyand’s hernia with different contents as appendix and colon (inguinal and incisional hernia).
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The first case of stone in the inguinal hernial sac was reported by Mazdak et al. [1] and chemical analysis showed organic material with proteins, calcium oxalate etc. Kulacoglu et al. [4] presented a case of epiploic appendicitis of the sigmoid colon secondary to torsion in the inguinal hernial sac as an inguinal mass.

The composition of the stone includes calcium, magnesium, ammonia, phosphates, oxalates, urates and in case of metabolic disorders cysteine and xanthine and depends on the etiopathogenesis. Stone formation can occur due to genetic and environmental factors also. Dietary intake of various foods and fluids that result in excesses or deficiencies of substances that produce stones has a significant effect on incidence of urinary calculi. Hyperoxaluria caused by autosomal recessive genetic disorders of oxalate synthesis, increased intestinal oxalate absorption secondary to malabsorptive disease, alteration in gut flora which may lead to low oxalate degradation in the colon [5].

Cross-sectional imaging missing the diagnosis implies a need for surgical exploration (usually laparoscopic nowadays) to get the diagnosis though not necessarily surgical resection [6]. But still USG and CT-scan of the abdomen are the helpful investigations where diagnosis remains in doubt. An extremely rare case of an ovulating ovary found in an incarcerated inguinal hernia presented by Golash and Cummins [7]. Three cases of traumatic abdominal wall hernia due to blunt trauma were reported by Singal et al. [8] and managed surgically. They concluded that USG and CT-scan helped to decrease the morbidity and mortality. In retrospective study, Ballas et al. [9] found six cases with an unusual finding in inguinal hernia surgery out of 856 patients.

**Conclusion**

Chronic infection may cause calcification of the fatty tissue and lead to stone formation in an uncontrolled diabetic patient as in our present case. X-ray, USG and CT of the abdomen are useful investigations to diagnose stone pathology in hernia but these are not the routine tools for asymptomatic inguinal hernia cases. However, we don’t recommend that every patient should undergo X-ray and ultrasonography in hernia cases. Nevertheless, misdiagnosis can lead to unnecessary antibiotherapy, and even to surgery.

**Disclosure of interest:** the author declares that he has no conflicts of interest concerning this article.

**References**