CASE REPORT

Mesenteric bones: Intra-abdominal heterotopic ossification

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SUMMARY

Intra-abdominal heterotopic ossification usually develops after abdominal surgery and can cause complications such as bowel obstruction and even intestinal perforation. Bisphosphonates, NSAIDs and even local radiation is used as prophylaxis or treatment. Surgeons must consider heterotopic ossification and its complications as a differential when managing complex polytrauma patients with suspicious radiographic densities.

INTRODUCTION

Heterotopic ossification is presence of bone in non-ossifying tissue. It is extremely rare, and Wilson et al., first described the term in 1999.[1] There are two types, hereditary which is known as Myositis Ossificans Progressiva and acquired which is most often precipitated by trauma (musculoskeletal trauma, fractures or orthopaedic procedures) and less commonly abdominal incisions, wounds and the gastrointestinal tract, or a neurogenic cause. We report an asymptomatic case of intra-abdominal heterotopic ossification seen in an individual who underwent multiple laparotomies following a traumatic duodenal injury with grade III liver laceration and pancreatic contusions.

CASE REPORT

A 34-year-old Chinese male was involved in a motor vehicle accident and sustained a D1 transection with Grade III liver injury and pancreatic tail laceration complicated with transverse colon perforation and duodenal stump leak, and he underwent a laparotomy with duodenostomy and tranverse colostomy on presentation. He required prolonged hospital stay for wound care and required parenteral nutrition after developing multiple colocutaneous fistulas. His recovery was complicated with persistent hypercalcemia, raised alkaline phosphatase and recurrent episodes of sepsis. A contrasted Computed Tomography scan (CT scan) two months post trauma showed extensive ectopic calcifications in the abdomen with bilateral small renal calculi. He underwent reconstructive surgery for his injuries four months after his accident. Intraoperatively noted multiple calcified plates along the bowel mesentery and peritoneum, which we completely removed. His recovery was uneventful and is now able to take orally. A repeat CT scan six months post operatively showed no recurrence of abdominal calcifications and the serum calcium and alkaline phosphatase levels normalised.

DISCUSSION

Heterotopic Ossification is a benign metaplastic condition. Wilson et al., first described it in 1999 showing formation of bone in tissues that normally do not ossify.[1] It is a well-known complication post orthopaedic surgery but is uncommon in vascular or abdominal surgery. It usually occurs in soft tissue locations of trauma, sites of previous surgery, patients with prolonged immobilisation, burns and neoplasia.[2] Data shows up to 25% of patients with midline laparotomy develop heterotopic ossification as seen in our patient.[2] It mainly affects males between ages of 18-81, occurring within the first year of surgery, is usually self-limiting and may go into regression thereafter.[2]

The pathogenesis of this condition is not clearly defined but literature points to a 4-stage process for osteogenic induction. It begins with a form of primary insult and within an ideal environment leads to an inappropriate differentiation of mesenchymal cells into osteoblastic stem cells in response to still unidentified inducing agents. [3]

Risk factors for Heterotopic Ossification can be classified into trauma which is attained from surgical trauma i.e., operations, fractures, dislocations, burns and contusions. Injury to brain and/or spinal cord, injection of CNS for polio and tetanus and lastly genetic predisposition in conditions such as fibrodysplasia ossificans progressive, progressive osseous heteroplasia and Albright's hereditary osteodystrophy.[4]

Patients can present with intestinal obstruction, abdominal pain, nausea, vomiting, obstipation and distention or perforation with peritonitis and enterocutaneous fistulas if it involves omentum[5] as seen in our patient. Lab results demonstrate raised alkaline phosphatase due to osteoblastic activity which is a sensitive indicator for heterotopic ossification.[5] Diagnosis is confirmed using a CT scan, which reveals multiple linear branching opacities with trabecular ossifications.[5] Serial bone scans can be used to monitor the metabolic activity of Heterotopic Ossification and determine the appropriate time for surgical resection, or to predict post- operative recurrence.[5] However, this was not done in this case due to logistics reasons and cost of service.

Surgical intervention is usually performed in symptomatic cases or for the treatment of complications and is the treatment of choice. Medical management advocates use of anti-inflammatory drugs, diphosphonates and radiotherapy

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Fig. 1: Specimens removed from patient intraoperatively.

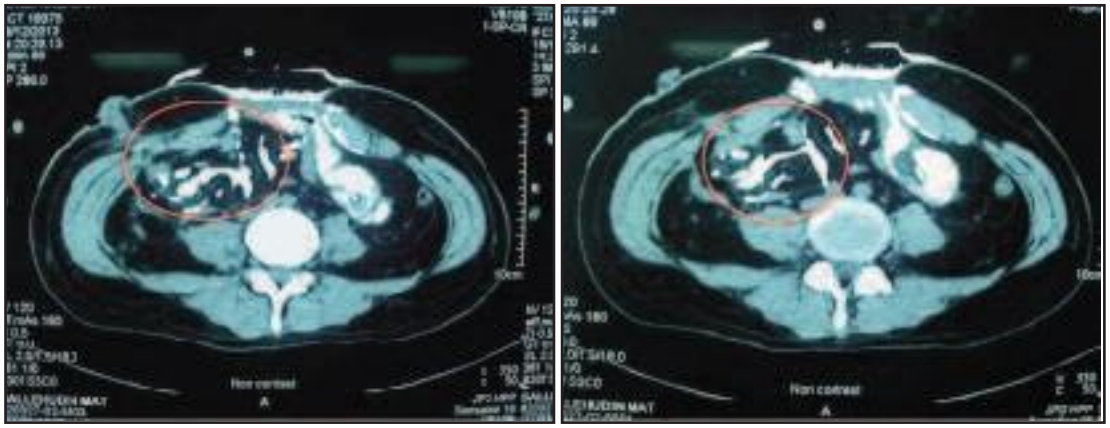

Fig. 2: CT Scan Images showing multiple linear branching opacities with trabecular ossifications.

may prove useful in prevention of recurrence, while anti-inflammatory drugs also reduce the incidence of the disease. There is data which supports the use of NSAIDs and diphosphonates in preventing the formation of heterotopic ossification.[2] In summary, heterotopic mesenteric ossification is a rare disorder, which can develop after abdominal operation and cause severe complications such as bowel obstruction and even intestinal perforation. The characteristic imaging features of heterotopic mesenteric ossification should be kept in mind, which could lead to the correct pre-operative diagnosis. Novel and relatively cost-effective methods of prevention as explained in this case report are available and can be explored to prevent this condition locally.

REFERENCES

1. Wilson JD, Montague CJ, Salcuni P, Bordi C, Rosai J. Heterotopic mesenteric ossification ('intraabdominal myositis ossificans'): report of five cases. Am J Surg Pathol 1999; 23(12): 1464-70.
2. Koolen PG, Schreinemacher MH, Peppelenbosch AG. Heterotopic ossifications in midline abdominal scars: A critical review of the literature. Eur J Vasc Endovasc Surg 2010; 40(2): 155-9.
3. Shehab D, Elgazzar AH, Collier BD. Heterotopic Ossification. J Nucl Med 2002; 43(3): 346-53.
4. Balboni TA, Gobezie R, Mamon HJ. Heterotopic ossification: Pathophysiology, clinical features, and the role of radiotherapy for prophylaxis. Int J Radiat Oncol Biol Phys. 2006; 65(5): 1289-99.
5. Kao HW, Liou CH, Chang WC, Yu CY, Chen CY. Imaging features of heterotopic mesenteric ossification: A case report and literature review. Chinese Journal of Radiology 2005; 30(1): 55-8.