Heterotopic mesenteric ossification is extremely rare. Here, we report a case of heterotopic mesenteric ossification in a 60-year-old man who underwent a Hartmann procedure with ileostomy for treatment of diverticulitis spanning the descending and sigmoid colon about 2 months ago. Imaging studies of the abdomen, including roentgenography, ultrasound, and computed tomography (CT) revealed diffuse curvilinear high densities with mature trabecular texture dispersing within the mesentery. The patient underwent a laparotomy with partial resection of the lesions. Heterotopic mesenteric ossification was diagnosed by pathologic examination. The characteristic imaging features of this rare entity were discussed and literature was reviewed.

**Key words:** Mesentery, CT; Mesentery, disease; Heterotopic ossification

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the mesentery (Fig. 4) of the distal jejunum and ileum. The peritoneum and abdominal wall were not involved. Only a small portion of the bone within the mesentery can be resected during the operation. Pathologic examination confirmed the presence of heterotopic bone formation within the mesentery. Histopathology of these heterotopic bones showed mature trabeculation without presence of bone marrow or zonal phenomenon. Although the mesenteric ossification was not totally removed, the patient did not experience significant symptoms of bowel obstruction in the following year.

**DISCUSSION**

Heterotopic mesenteric ossification is a rare disorder describing a metaplastic process that occurs within the mesentery. The term “heterotopic ossification” refers to formation of bone outside the skeletal system. Occurring in somatic soft tissues, myositis ossificans is the most familiar form of heterotopic ossification usually associated with blunt or tearing trauma. Post-traumatic heterotopic ossification can be found at any site. Hip is the most common site after total hip arthroplasty, traumatic brain injury, or spinal cord injury. As intraabdominal counterpart of myositis ossificans, heterotopic mesenteric ossification usually developed after abdominal operation. It may cause intractable symptoms or functional limitations that require surgical treatment. Frequent recurrence of the ossification presents a therapeutic challenge [1].

To our knowledge, only eleven cases of heterotopic mesenteric ossification have been reported in the English literature [1-5]. Most of the cases developed small bowel obstruction by the ossifications after one or more abdominal operations for nonneoplastic disease [2]. Fortunately, our patient not yet experienced significant symptoms of bowel obstruction. Among these cases, imaging feature of this disorder was rarely documented. Hikim et al. described such a case with trabecular-architecture radiodensities evident on both roentgenography and CT study [5]. In our case, similar curvilinear radiodensities with mature trabecular texture within the mesentery were also demonstrated on imaging studies.

The differential diagnoses of heterotopic mesenteric ossification include barium extravasation, dystrophic calcification, or osseous neoplasm. However, the mature trabecular texture of the opacifications on the abdominal roentgenography should help distinguishing heterotopic mesenteric ossification from these mimicking diagnoses. Furthermore, whether barium extravasation occurs could be certain with the knowledge of clinical history. In our case, the fact that barium contrast study was not performed before the CT examination excluded the possibility of barium extravasation.

In contrast to the location of mesentery, incision scar is the more common site of heterotopic ossification that develops after abdominal surgery [6]. As a form of myositis ossificans traumatica, heterotopic
Ossification of abdominal surgical scars usually occurs within longitudinal incisions and has distinct location different from that of mesenteric ossification. The pathogenesis of the heterotopic ossification involves the local differentiation of multipotent mesenchymal cells [7]. The contributing factors may include local trauma, inflammation, and venous stasis [8, 9]. In addition, a local osteo-productive factor named bone morphogenetic protein has been identified contributing to heterotopic ossification [10, 11]. It causes chemotaxis, proliferation of mesenchymal cells, cartilage deposition and osteoblast-mediated osteogenesis. Finally, normal lamellar bone developed after remodeling.

In summary, heterotopic mesenteric ossification is a rare disorder, usually developing after abdominal operation and causing 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.

REFERENCES

Figure 3. Non-enhanced abdominal CT at the level of ileostomy stoma revealed diffuse curvilinear high densities (arrows) dispersed within the mesentery extending to the stoma.

Figure 4. A segment of resected bowel (arrowheads) clearly demonstrated a heterotopic ossification (arrow) within the mesentery.
腸繫膜異位性骨化之影像表現：病例報告及文獻回顧

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腸繫膜異位性骨化十分罕見，我們報告一位60歲男性在2個月前因降結腸及乙狀結腸有憩室炎，接受Hartmann手術治療。一系列的腹部影像檢查，包括X光素片、超音波、及電腦斷層顯示出曲線狀高密度病灶合併成熟的骨樣結構散布於腸繫膜中。之後病人接受腹腔手術，病理檢查確定診斷為腸繫膜異位性骨化。我們在文中討論這種罕見疾病的影像特徵並回顧文獻報告。

關鍵詞：腸繫膜，電腦斷層攝影：腸繫膜，疾病：異位性骨化