Abdominal-wall myositis secondary to intra-arterial chemotherapy for femoral osteosarcoma

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Abstract With the increasing application of intra-arterial chemotherapy (IAC), new side-effects are encountered. We describe two children with proximal femoral osteosarcoma who developed focal myositis of the abdominal wall musculature after IAC. In both cases, myositis presented as abdominal pain and mimicked acute abdomen. US demonstrated asymmetrical thickening of abdominal-wall musculature in the right lower abdomen. This diagnosis should be considered when evaluating the patient with unexplained abdominal pain and a history of IAC.

Introduction

The role of neoadjuvant chemotherapy for osteosarcoma has been well established [1, 2]. Recently, the use of pre-operative chemotherapy has been further enhanced by the use of intra-arterial chemotherapy (IAC) [3–6]. The most common systemic complications of IAC are nausea and vomiting. Localised pain and tenderness in the area infused are not uncommon complications, and this localised toxicity is considered to be due to myositis or dermatitis [3, 4, 7].

We present two cases of focal myositis complicating intra-arterial chemotherapy for osteosarcoma. This process involved the anterior abdominal-wall musculature and produced symptoms mimicking acute abdomen.

Case reports

Patient 1

A 10-year-old boy, who had undergone a second course of IAC for osteosarcoma of the proximal right femur on the previous day, presented with severe abdominal pain. Via a left femoral approach, the tip of the intra-arterial catheter had been placed at the bifurcation of the right common femoral artery because the tumour was supplied by both superficial and deep femoral arteries. Intra-arterial cisplatin (130 mg/m² in 300 ml of normal saline) was infused over 2 h via an infusion pump and followed by IV doxorubicin (90 mg/m² in 5 % dextrose water). The catheter was removed after 2 h of cisplatin infusion, and shortly after he complained of severe pain in the right lower abdomen. Physical examination showed localised and rebound tenderness in right lower abdomen. The skin overlying the abdominal wall was normal in appearance. Plain radiography showed gasous distension of small bowel in the lower abdomen, suggesting paralytic ileus. Although fever and leucocytosis were absent, the possibility of appendicitis could not be excluded.

US was performed to exclude acute abdomen. Unexpectedly, it revealed asymmetrical thickening of the anterior abdominal wall in the right lower quadrant (Fig. 1 a). There was no gas or necrosis in the abdominal-wall musculature. There was no intraperitoneal fluid or any other signs suggestive of appendicitis. We postulated that upstream migration of the intra-arterial catheter during the infusion resulted in infusion of the chemotherapeutic agent into small branches that supply the abdominal wall muscles (deep circumflex iliac artery or inferior epigastric artery), causing focal myositis (Fig. 1 b). The patient was managed conservatively and his symptoms resolved.
Patient 2

A 101/2-year-old girl with osteosarcoma of the proximal right femur complained of right lower-abdominal pain of acute onset. She had been treated with IAC cisplatin and systemic doxorubicin 2 days previously. Physical examination revealed tenderness and rebound tenderness with erythematous skin in the right lower abdomen. At presentation, she was not toxic, but complained of severe abdominal pain. Vital signs and laboratory results were normal.

US revealed asymmetrical thickening of the right rectus abdominis muscle, suggesting focal myositis (Fig. 2). There were no abnormal fluid collections or signs suggestive of appendicitis. The patient was managed conservatively and discharged without clinical or laboratory abnormality.

**Discussion**

IAC has been used to maximise local drug concentration without increasing systemic toxicity and thus further enhance pre-surgical tumour shrinkage [3–6]. However, with the increasing application of IAC, new and different side-effects have been encountered [3, 4, 7].

Although the majority of patients develop asymptomatic dermatitis over the region of infusion, they occasionally develop painful focal myositis or dermatitis secondary to incomplete mixing and streaming of chemotherapeutic agent into a small vessel, or migration of the catheter into such a vessel [4, 7]. However, in IAC for extremity osteosarcoma, myositis involving the abdominal-wall musculature is unusual. The major arteries that supply the abdominal wall are two from above, the superior epigastric and musculophrenic...