Bilateral scapular fractures after electrocution

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Fractures of the body of the scapula are usually caused by direct high-energy trauma[1,2]. Occasionally, however, they result from indirect injury.

CASE HISTORY

A 51-year-old engineer sustained a mains electric shock (240 V, 50 cycles per second) while testing a washing machine. He felt the current travel up his left arm, across the shoulders and down the right arm. After 15–20 seconds he managed to pull his left arm free. He did not fall down and did not lose consciousness. On arrival at hospital, he was complaining of severe pain in both shoulders. Examination of the nervous system and cardiovascular system revealed nothing abnormal but he was very tender over the scapulae with restriction of shoulder movements bilaterally. X-rays revealed bilateral extra-articular fractures of the scapulae. An electrocardiogram was normal but his serum creatine kinase (CK) was raised at 313 iu/L. He was admitted for cardiac monitoring and pain relief. A computed tomographic scan of his shoulders was obtained to assess the extent of his fractures and to rule out any intra-articular extensions of the fractures (Figures 1 and 2). Although his CK rose to 1049, he never had cardiac symptoms and the electrocardiogram remained normal. His fractures were treated non-operatively in slings, with progressive physiotherapy and analgesia. He was discharged on day 10 and three months after the injury he was pain-free and had regained a full range of movements in both shoulders.

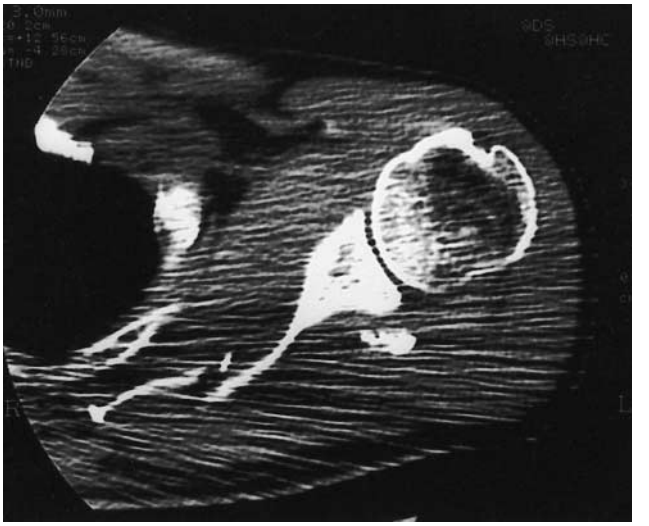

Figure 1 **Computed tomographic scan, right shoulder**

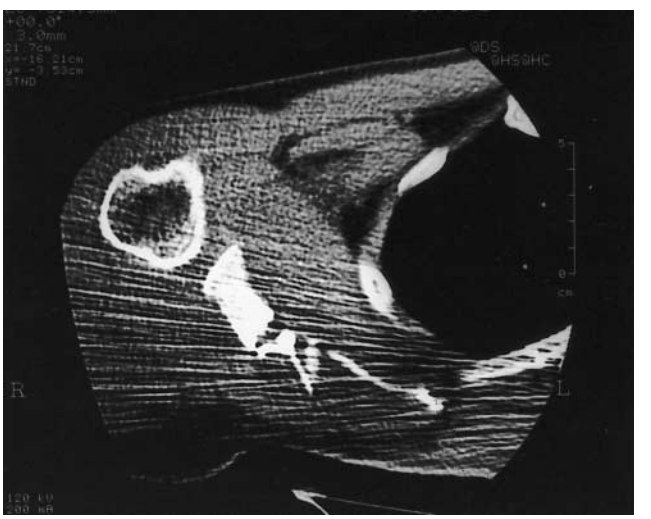

Figure 2 **Computed tomographic scan, left shoulder**

COMMENT

Scapular fractures have been reported after seizures[3,4] and electroconvulsive therapy[5]. The usual cause of skeletal injury following electrocution is a fall resulting from the shock[6] (electrocution may cause tetany or ventricular fibrillation[7]).

Scapular fractures as a result of electric shock without associated direct trauma are rare indeed. The usual orthopaedic injury after electric shock is a posterior fracture–dislocation of the shoulder. Very few bilateral scapular fractures following electric shock have been reported[8–10]. This unusual injury must be recognized as a possible complication of electrical injury and must be looked for clinically and radiologically if there is doubt. If scapular fractures are detected, extensions into the glenoid must be ruled out.

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Combined Galeazzi and Monteggia forearm fracture

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A combination of Monteggia and Galeazzi fractures is rare; only one previous example has been reported, in a child who was managed non-operatively[1].

CASE HISTORY

A woman aged 28 fell down a flight of stairs and sustained an injury to her right forearm. On examination it was swollen and deformed, with a clean puncture wound on the dorsal aspect. Her radial pulse was palpable and there was no circulatory or neurological deficit. Radiography (Figure 1) showed a segmental fracture of the midshaft of the ulna, minimally comminuted and associated with a dislocation of the radial head (Monteggia fracture). In addition, there was a fracture of the radius associated with disruption of the distal radio-ulnar joint (Galeazzi fracture). She underwent emergency surgery as follows: debridement of wound; open reduction and plating of the segmental ulnar fracture with a 10 hole 3.5 mm dynamic compression plate; open reduction of the radial head with repair of the annular ligament; closed reduction of the distal radial fracture and disrupted distal radio-ulnar joint, with K wire fixation (Kapandji technique) of the distal radial fracture (Figure 2); primary closure of all wounds.

Postoperatively a plaster of paris back slab was applied and the arm was elevated with hourly testing of distal sensation and circulation. She was discharged 9 days later. The K wires were removed in the clinic 4 weeks postoperatively. 2 weeks after this the plaster cast was removed and she was referred for physiotherapy, active and passive mobilization. One year after surgery the patient works full time as a shop assistant and her only symptom of note is aching on lifting heavy objects. The range of movement is flexion from 10° to 140°, supination 0° to 80° and pronation 0° to 90°.

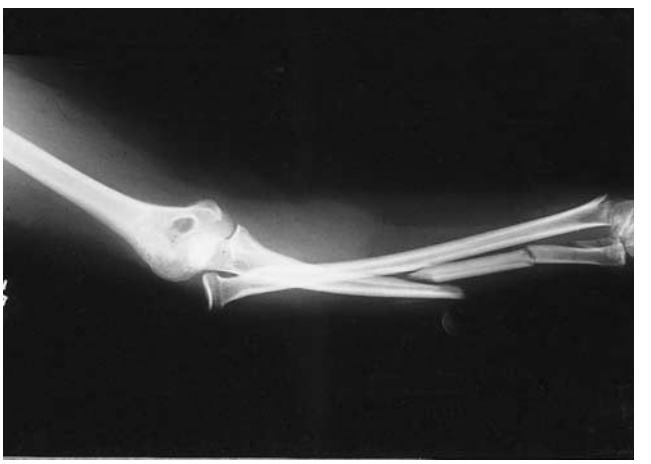

Figure 1 **Preoperative X-ray**

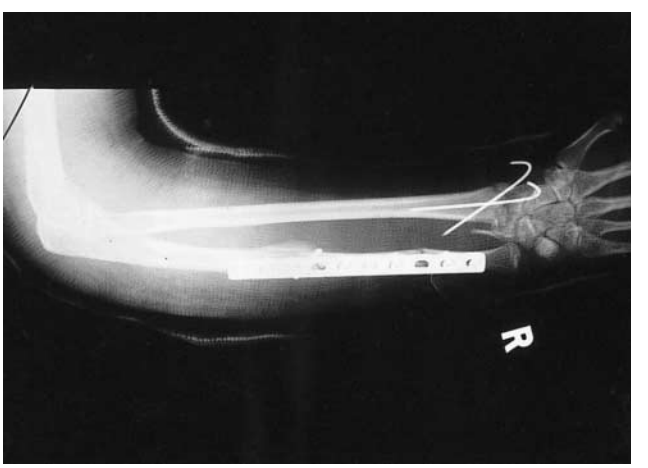

Figure 2 **Postoperative X-ray**

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COMMENT

Monteggia and Galeazzi fractures both result from falls onto the outstretched and pronated forearm[2]. Bado[3] classified Monteggia fractures into four types, of which type 1 (anterior dislocation of the radial head) is by far the commonest. This was the direction of dislocation in our case. In the single reported case of a combined fracture, in a child, treatment was by closed manipulation of the arm followed by plaster immobilization for 8 weeks; the outcome was good[1]. For best functional results, however, Monteggia and Galeazzi fractures should usually be treated by anatomical reduction and internal fixation[4]. Close observation and elevation is essential, since neurovascular complications can develop at the time of the injury or later as a consequence of compartment syndrome. It should be remembered that a fracture involving both forearm bones will be associated with substantial soft-tissue injury. Wounds should be closed without tension to allow for postoperative tissue swelling; or, if this is not possible, they should be left open for subsequent delayed closure or skin grafting. On occasion, fasciotomy and carpal tunnel release will be indicated.

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Stromal tumour of the small bowel

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The small bowel accounts for 90% of the surface area of the gastrointestinal tract and has a higher rate of cell turnover than any other tissue, yet malignant small bowel tumours are rare, constituting only 1–1.4% of gastrointestinal neoplasms[1].

CASE HISTORY

A woman aged 60 reported non-specific abdominal pain, anorexia and weight loss for the past 6 months. She had a smooth firm mass in her left iliac fossa. Blood tests were all normal except for alkaline phosphatase, raised at 380 iu/L. On ultrasonography there was a large irregular bowel-related mass in the left iliac fossa but the only abnormality on colonoscopy was mild sigmoid diverticular disease. A computed tomographic (CT) scan confirmed the presence of a mass of mixed density closely adherent to a loop of bowel (Figure 1). At laparotomy, a large lobulated mass measuring $80 \times 60 \times 65$ mm was found within the ileal mesentery, closely adherent to the distal jejunum. After a small-bowel resection the patient recovered uneventfully and was well 3 months postoperatively. Histological examination showed a pleomorphic spindle cell tumour arising from the muscularis propria of the small bowel. The tumour was close to, but did not reach, the peritoneal surface. Twenty mesenteric lymph nodes were free of metastatic deposits. Within the tumour there were several areas of marked hypercellularity, a moderate degree of necrosis, and up to 20 mitoses per ten high-power fields. On immunostaining the tumour cells were positive for CD34, smooth muscle actin and desmin. These appearances were of a malignant gastrointestinal stromal tumour, with smooth muscle (myogenic) differentiation.

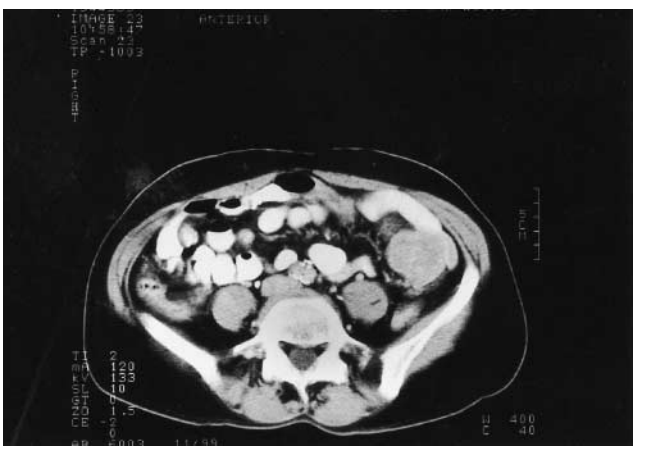

Figure 1 **Computed tomographic scan of abdomen showing large lobulated mass of mixed density closely adherent to loop of bowel**

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COMMENT

Gastrointestinal stromal tumours are mesenchymal tumours of the gastrointestinal tract composed of spindled and/or epithelioid cells. Their histological, immunophenotypic and molecular genetic features set them apart from typical smooth-muscle tumours. They are classified into five cell types—Cajal, myogenic, Schwann, mixed and undifferentiated.

Gastrointestinal stromal tumours constitute only 1% of all gastrointestinal malignancies and about 10% of all sarcomas[2]. They can arise from either intestinal or vascular smooth muscle, presenting most frequently in the fifth and sixth decades of life with male predominance. The stomach and the distal small intestine are the two most common locations[3]. Benign gastrointestinal stromal tumours outnumber malignant tumours by ten to one.

Diagnosis of gastrointestinal stromal tumours is often delayed because symptoms and signs are non-specific. The most common symptoms are abdominal pain, gastrointestinal bleeding, and abdominal mass[4]. Gastrointestinal stromal tumours may be submucosal, subserosal, or intraluminal, and intraluminal tumours tend to present earliest, with bleeding or intestinal obstruction; extraluminal lesions can reach a large size before causing symptoms, as in this case. Late diagnosis is sometimes due to inappropriate evaluation[5]: diagnosis of these tumours is difficult when they grow outside the lumen and a small-bowel X-ray series may then show no mucosal abnormality. Arteriography may be a better technique, since the tumours are often hypervascular[6]. Ultrasound and CT are useful in delineating the larger lesions.

Gastrointestinal stromal tumours spread by direct extension into adjacent organs and by the haematogenous route to liver, lungs, and bone. Lymph node metastasis is uncommon, even with large tumours[7,8]. Complete resection is the treatment of choice for malignant gastrointestinal stromal tumours. Five-year survival after curative resection ranges from 40% to 63%[4,6,9]. The most important factor affecting survival is the histological grade[8], determined by a composite assessment of the mitotic rate, degree of atypia, degree of cellularity and degree of differentiation. Of these, the mitotic count seems the most objective and reproducible element; tumours with mitotic counts higher than 5 per ten high-power fields have a substantial risk of recurrence and metastasis[3]. Operative cure is likely only with small low-grade tumours that are completely excised. All other patients should be considered at risk for disease recurrence. Adjuvant chemotherapy and radiotherapy do not seem beneficial.

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