IDIOPATHIC AVASCULAR NECROSIS OF THE SCAPHOID

A REPORT OF TWO CASES

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Two cases of idiopathic avascular necrosis of the scaphoid are reported and it is suggested that the aetiology could be the same as that recently described for Keinboeck's disease by Beckenbaugh et al. (1980). The condition described in this paper is a different entity from that described by Preiser (1910), which was probably not an osteochondritis but an undiagnosed fracture.

Avascular necrosis of the proximal pole of the carpal scaphoid is a well-recognised complication of an obvious fracture. The accepted explanation is that the blood supply to the proximal pole, which enters the bone distal to the fracture, is disrupted. When, in the absence of a history of injury, the proximal pole becomes necrotic, this could be referred to as "idiopathic" avascular necrosis. The process could be compared with that which occurs in other bones, the commonest example being in the femoral head.

This paper presents two cases of idiopathic avascular necrosis of the scaphoid. The condition has not been reported previously in the English literature. Its radiographic appearance distinguishes it from the condition described by Preiser in 1910 which has often been grouped with Keinboeck's disease of the lunate as one of the osteochondritides.

ILLUSTRATIVE CASE HISTORIES

Case 1. A fit 24-year-old housewife presented to her general practitioner with a painful wrist of two months' duration. There was no history of any injury, but her symptoms had begun after she had been knitting a sweater for her husband. A radiograph taken at that time showed no abnormality (Fig. 1). The symptoms gradually became worse over the next 18 months and she was referred to St Thomas' Hospital, London.

On examination, the only abnormal clinical findings were in the right wrist, which was swollen and tender over the dorsal and volar aspects. The wrist was irritable, all movements being painful and limited, but movements of the metacarpophalangeal joints were normal. Blood tests, including the erythrocyte sedimentation rate, white cell count and auto-immune profile, were all normal. A radiograph showed increased density and some collapse of the proximal pole of the scaphoid with degenerative changes in the radioscapophoid joint (Fig. 2).

A technetium bone scan showed increased uptake in the bone which was reported as being compatible with recovery after avascular necrosis. At operation, degenerative changes were confirmed at the radioscapophoid joint and, in view of the stiffness, an arthrodesis was performed rather than an arthroplasty. A small portion of the proximal scaphoid was removed for histological examination. The sections showed areas of dead bone among areas of living vascularised bone, confirming the diagnosis of avascular necrosis (Figs 3 to 5).

Case 2. A fit 38-year-old housewife was referred to the casualty department of the Princess Margaret Hospital, Swindon with a three-month history of pain in the left wrist which had developed gradually.
over a week; although there had been no specific injury she did recall using a new lawn mower at the time. Initial examination revealed a local swelling and tenderness over the anatomical snuffbox, but movements were full. A radiograph showed a small cyst in the distal pole of the scaphoid and possibly increased density of the proximal pole, but no evidence of fracture (Fig. 6). She was given a removable splint and referred to the orthopaedic department. When she was seen almost a month later the clinical findings were the same and the results of radiography were interpreted as showing no change from the initial film, but close inspection of the proximal pole showed a possible further increase in density. She failed to attend for review six weeks later, but returned for examination after six months due to continuing pain with a recent exacerbation. She had difficulty in gripping objects and activities such as gardening and playing the piano had become painful. Examination revealed slight swelling over the dorsum of the carpus and tenderness over the proximal pole of the scaphoid. Flexion and extension were slightly limited, but other movements were full. A radiograph showed the small cyst in the distal pole to be unchanged, but the proximal pole showed a definite increase in density with some fragmentation (Fig. 7). At present she is being treated conservatively with a removable splint.

DISCUSSION

The reported incidence of avascular necrosis after fractures of the scaphoid varies from two to nine per cent in acute fractures (Stewart 1954; Cooney, Dobyns and Linscheid 1980; Weber 1980) with a four per cent incidence in a selected series of non-unions reported by Cooney et al. (1980). Russe (1960), in his series of 220 fresh fractures, did not mention avascular necrosis, except to suggest that up to 30 per cent of fractures may develop increased density which was a reversible change, possibly resulting from severance of nutrient vessels. In another study, the incidence of some degree of ischaemia of the proximal pole of the scaphoid after fracture was placed as high as 12 per cent (Obletz and Halbstein 1938) but it is not clear whether avascular necrosis ensued.

All the reported cases of avascular necrosis were

Figure 3—Section of the scaphoid taken from the collapsed proximal pole showing articular cartilage overlying a surviving island of subchondral and trabecular bone. There is fragmentation around the margins and the trabecular spaces are filled with active granulation tissue. (Haematoxylin and eosin, × 25.) Figure 4—Higher power view of trabecular bone. Some lacunae have osteocytes with central nuclei but many are empty or have eccentric nuclei. (Haematoxylin and eosin, × 60.) Figure 5—Section of an area within the substance of the proximal pole showing dead trabeculae lying in a cartilaginous matrix (haematoxylin and eosin, × 150).

Figure 6—Radiograph of the left wrist three months after the onset of symptoms showing a cyst in the distal pole of the scaphoid and possible increase in density in the proximal pole. Figure 7—Radiograph taken six months after the onset showing a definite increase in density of the proximal pole and early fragmentation.
associated with obvious fractures. The only report of
necrosis occurring in the scaphoid unassociated with
fracture is that of George Preiser (1910). Preiser termed
the condition "ostochondrosis" (or osteochondritis) and
grouped it with other osteochondritides, notably Kein-
boeck's disease of the lunate. He described a central
sclerosis around a lytic area in five patients several
months after significant trauma to the wrist and attributed
this to an interruption of the blood supply. Preiser's
radiographs were taken before the standard views of the
scaphoid had been established, and none of his cases
showed an increase in density in the proximal pole. We
have interpreted his radiographs as showing an ununited
fracture seen on the anteroposterior view. The two cases
reported in this paper both demonstrated increased
density of the proximal pole of the scaphoid in the
absence of an obvious fracture. In Case 1, a radiograph
taken two months after the onset of symptoms was
normal, while at 18 months there was evidence of collapse
and degenerative change; histological examination con-
irmed avascular necrosis. In Case 2, while the radiograph
taken three months after the onset of symptoms did not
show a completely normal scaphoid, with cystic change
and possible increase in density, radiographs taken later
showed an increasingly dense proximal pole with some
fragmentation. There are no similar cases reported in the
literature.

Two questions need to be answered. First, how
can...