



## Avascular necrosis of the metacarpal head : Dieterich's disease

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A 68-year-old woman presented with an osteolytic image on the metacarpal head of the ring finger, first attributed to inflammatory or septic arthritis. She had experienced increasing pain three months before presentation, requiring orthopaedic treatment. At the time of clinical assessment, there was some limitation in the range of movement, accompanied by local pain and chronic swelling. Inflammatory arthritis was not confirmed on laboratory testing or scintigraphy. A diagnosis of Dieterich's disease was established based on the evolution of the condition, with chronic limitation of movement and no associated findings. Surgical treatment by arthroplasty was suggested, but was not accepted by the patient, given her satisfactory functional status.

**Keywords :** avascular necrosis ; metacarpal head ; atraumatic.

### CASE REPORT

A 68-year-old woman presented with swelling on the back of her right hand. She had a history of hypercholesterolaemia, hypertension, and of malaria at the age of 12. She had worked as a seamstress, but was now retired.

She had experienced progressive pain over the dorsum of the hand three months before the medical visit, which required immobilisation for two weeks with a digital-palmar splint. Radiographs did not show any joint alteration (fig 1). Since that time, swelling had persisted on the back of the metacarpophalangeal (MCP) joint of the ring finger. Physical examination revealed swelling over the dorsum of the right hand with no inflammatory signs, and pain upon palpation of the MCP joint.

### INTRODUCTION

Avascular necrosis of a metacarpal head is a rare condition, first described by Dieterich in 1932. Dieterich's disease has been associated with a history of trauma (5), systemic lupus erythematosus (9), steroid use (9), kidney transplantation (1), Freiberg's disease (3) and congenitally short digits. The disease can have a wide range of clinical symptoms, from no symptoms at all to pain, swelling and limited mobility.

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**Fig. 1.** — Posteroanterior radiograph of the patient's right hand taken just after the initial symptoms. There are no acute bone lesions and no bone erosions.

The articular status of the ring finger at the first examination was as follows: MCP joint,  $-20^{\circ}$  extension and  $60^{\circ}$  flexion; proximal interphalangeal joint,  $-5^{\circ}$  extension and  $100^{\circ}$  flexion; and distal interphalangeal joint, full extension and full flexion.

Further radiographs taken three months after the initial consultation (fig 2) showed an osteolytic image 4 mm in diameter on the metacarpal head of the ring finger, periosteal reaction over the metaphysis and first phalanx, and destruction of the joint line. Biochemical analyses documented a fibrinogen level of 3.70 g/L, and an erythrocyte sedimentation rate of 3 mm/1 h. On bone scintigraphy (fig 3), there were signs of an active inflammatory process.

The patient was seen again 18 months following the initial symptoms (fig 4). There was less swelling, with no significant changes in the articular status (table I). At the last follow-up, the swelling had disappeared and there were no signs of inflammation.

A repeat bone scan showed a lesion consistent with an arthritic process and no osteitis. There have been no clinical repercussions on her daily activity



**Fig. 2.** — Three months later, an osteolytic image is seen at the metacarpal head of the ring finger.

and the articular status has remained unaltered since the onset of the process.

Arthroplasty of the joint was suggested, but the patient denied any surgery.

## DISCUSSION

We present a case of Dieterich's disease, a condition characterised by avascular necrosis of a metacarpal head. Among all cases documented in the literature, 49% affect the middle finger, 19% the index finger, 19% the ring finger, 12% the little finger, and 5% the thumb. The male/female ratio of affected patients is 3:2 and the mean age at presentation is 27.3 years (range, 15-54) (9). The case pre-



**Fig. 3.** — Bone scan shows signs of an active inflammatory process.

sented is a 68-year old woman with involvement of the ring finger of the right hand. She had suffered progressive pain three months before she was first seen. The initial radiographs showed no osteolytic signs. According to Wright's findings, Dieterich's disease may be related with a compromised vascularisation of the metacarpal head. This may be because a main arteriole in the distal epiphysis is absent in 35% of the specimens studied, making these metacarpal heads solely dependent on small circumferential pericapsular arterioles (8).

The treatment for this condition varies (6) and includes splinting, curetting, bone grafting (4), replacement arthroplasty (2) and flexion osteotomy of the metacarpal neck (7). Various authors have reported that if avascular necrosis of the metacarpal head is not treated, it usually leads to collapse and



**Fig. 4.** — Two years later, there are no important changes of the joint surfaces, and minimal osteoarthritis degenerative signs.

ultimately gives rise to degenerative arthritis (1,3,5,9).

Our 68-year old patient may well develop degenerative arthritis, but since her condition is well tolerated clinically, we believe that surgery should not be considered at this time because of her age. If the clinical repercussions were to limit her

Table I. — Articular function at the initial examination and at 18 month-follow-up

JOINT	INITIAL		18 MONTHS	
	EXTENSION	FLEXION	EXTENSION	FLEXION
Metacarpophalangeal	-20°	60°	-20	60°
Proximal interphalangeal	-5°	100°	-10°	100°
Distal interphalangeal	0°	60°	0°	60°

regular activities, we would suggest the replacement arthroplasty option.

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