

## CASE REPORT

# DIETERICH'S DISEASE : AVASCULAR NECROSIS OF THE METACARPAL HEAD : A CASE REPORT

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**The authors report a case of non-traumatic avascular necrosis of the third metacarpal head. This very rare condition is known as Dieterich's disease and has been associated with trauma, systemic lupus erythematosus and steroid use.**

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### INTRODUCTION

Avascular necrosis of the bone is a well known complication of steroid use (4). Most frequently this occurs at the hip, talus or humeral head (4). Manifestations in the hand usually occur at the carpal bones ; avascular necrosis of a metacarpal head is very rare (2, 6).

### CASE REPORT

A 54-year old female cashier presented with a painful and swollen third metacarpophalangeal (MCP) joint of the right hand. These symptoms had started 3 months previously. There was no eliciting injury. She was being followed in our department since one year for avascular necrosis of the talus. She was a smoker (20 cigarettes a day) and took high doses of cortisone for severe inflammatory lung disease since more than one year.

The MCP joint of the middle finger was swollen due to synovitis. There was full extension but flexion at the MCP reached only 70°. The joint was tender on palpation.

A standard radiograph showed collapse of the metacarpal head and an osteochondral fracture with a clear cartilage step-off. Routine biochemical

analysis and rheumatological screening were normal.

Treatment with non-steroidal anti-inflammatory drugs and physiotherapy did not relieve her symptoms. Removal of the necrotic bone at the cartilage-bone junction and cancellous bone grafting from the distal radial epiphysis was performed, but the result was rather fair with flexion to 35° in the MCP and full extension.

### DISCUSSION

Avascular necrosis of the metacarpal head or Dieterich's disease is extremely rare and has been associated with trauma, systemic lupus erythematosus (SLE), congenitally short digits and steroid use (1, 2, 3, 5, 6).

It has been reported in all the metacarpal heads but appears to involve most frequently the long finger, followed by the index, ring and small fingers. The thumb is least commonly involved (2, 7).

Wright and Dell (7) who studied the vascularity of the metacarpals found that in 35% of the specimens, a main arteriole in the distal epiphysis was absent, making these metacarpal heads solely dependent on small circumferential pericapsular arterioles. This pattern is even more frequent in the middle finger (60%).

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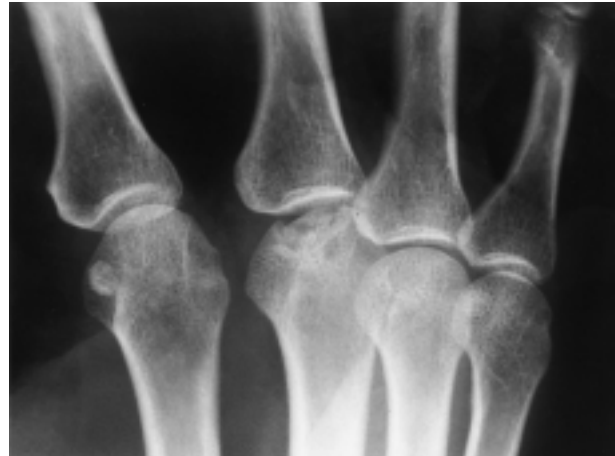
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*Fig. 1.* — Standard radiograph with collapse of the third metacarpal head and osteochondral fracture.

Blunt trauma to the metacarpal head with joint effusion may compress the periosteal blood vessels causing necrosis (1, 2, 3). In SLE avascular necrosis occurs due to vasculitis of the small end arterioles (7). These arterioles are also occluded in steroid use owing to the enlargement of the chylomicrons (7).

If the diagnosis is not obvious on standard radiographs and there is only some flattening of the metacarpal head or disruption of the trabecular pattern, further investigation is necessary (2).



*Fig. 2.* — Close-up of the third metacarpal clearly demonstrating the osteochondral lesion with disturbed trabecular pattern and articular step-off.

A technetium scan will show an area of increased uptake at the involved MCP joint (2). At the same time it is useful screening for the other bones in patients using steroids.

Recently MRI proved to be very useful to establish the diagnosis of avascular necrosis. It also allows to evaluate the extent of the necrotic zone and the involvement of the overlying cartilage (2). Usually MRI demonstrates a hypointense zone on T1-weighted images and a hyperintense zone on T2-weighted images both suggestive of avascular necrosis (2).

Several treatment options ranging from rest to surgery exist. The type of surgery depends on the quality of the cartilage layer. If this is still good subchondral debridement and cancellous bone grafting gives excellent results (2).

If the cartilage is destroyed however silicone arthroplasty or arthrodesis may be necessary.

## REFERENCES

1. Barrueco J., Zapatero M., Lignereux Y., Regodon S. Osteochondritis dissecans of the head of the second metacarpal bone. *J. Hand Surg.*, 1992, 17-A, 1079-1081.
2. De Smet L. Avascular necrosis of the metacarpal head. *J. Hand Surg.*, 1998, 23-B, 552-554.
3. Green D., Terry G. Complex dislocations of the metacarpophalangeal joint. *J. Bone Joint Surg.*, 1973, 55-A, 1480-1486.

4. Mirzai R., Chang C., Greenspan A., Gershwin M. The pathogenesis of osteonecrosis and relationship to corticosteroids. *J. Asthma*, 1999, 36, 77-95.
5. Renton P., Hallett J. Abnormal metacarpal heads in brachymesophalangy : report of a case and review of the literature. *J. Hand Surg.*, 1981, 6, 545-549.
6. Segmüller G.. Morbus Dieterich, Osteonekrose Metacarpale III. *Orthopäde*, 1981, 10, 64-65.
7. Wright T., Dell P. Avascular necrosis and vascular anatomy of the metacarpals. *J. Hand Surg.*, 1991, 16-A, 540-544.

### SAMENVATTING

*E. THIENPONT, W. VANDESANDE, L. DE SMET.*  
*Ziekte van Dieterich : avasculaire necrose van de kop van de metacarpaal : een geval.*

De auteurs stellen een geval voor van atraumatische avasculaire necrose van de derde metacarpaalkop. Deze

zeldzame aandoening is bekend als de ziekte van Dieterich en werd geassocieerd aan trauma, systeem lupus erythematosus en steroid gebruik.

### RÉSUMÉ

*E. THIENPONT, W. VANDESANDE, L. DE SMET.*  
*Maladie de Dieterich ou nécrose ischémique d'une tête métacarpienne : présentation d'un cas.*

Les auteurs présentent un cas de nécrose ischémique non traumatique de la tête du 3<sup>ème</sup> métacarpien. Cette affection très rare est connue sous le nom de maladie de Dieterich ; elle a souvent été associée à un traumatisme, un lupus érythémateux systémique ou une corticothérapie.