

# Surgical management of septic metacarpal physisitis and concurrent serofibrinous fetlock arthritis: 2 cases.\*

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## Summary

The clinical, ultrasonographic, radiographic, cytologic and bacteriologic findings, diagnosis and surgical treatment of two heifers with septic metacarpal physisitis (type-1 osteomyelitis) and concurrent serofibrinous arthritis of the metacarpophalangeal (MCP) joint are described. Osteomyelitis likely occurred by haematogenous spread following bronchopneumonia in one heifer and developed post-traumatically in the other. In both patients, ultrasonographic examination using the 7.5 MHz linear probe showed moderate effusion of the palmar and dorsal MCP joint pouches and highly irregular bone contours with depression and periosteal new bone formation at the metacarpal growth plate. Radiographs showed an extensive radiolucent area with poorly defined margins at the level of the metacarpal growth plate.

Surgical treatment was carried out under sedation and regional intravenous anesthesia and involved meticulous debridement of the osteomyelitic lesion of the metacarpal growth plate combined with arthrotomy of the MCP joint and repeated lavage of the bone cavity and joint. Successful outcomes were achieved by combined use of systemic and locoregional antibiotics, NSAIDs, temporary external coaptation and adequate housing.

**Key words:** Osteomyelitis, growth plate, arthritis, ultrasonography, radiography, cattle

## Chirurgische Behandlung einer septischen Osteomyelitis der distalen Wachstumsfugen des Metakarpus mit serofibrinöser Arthritis des Fesselgelenkes bei zwei Färsen

Der Fallbericht beschreibt die klinischen, sonographischen, röntgenologischen Befunde, die Ergebnisse der Synovialzytologie und die bakteriologischen Befunde, die Diagnose sowie das chirurgische Behandlungsregime bei Vorliegen einer Osteomyelitis an den distalen Wachstumsfugen (Typ-1 Osteomyelitis) des Metakarpus sowie einer damit einhergehenden serofibrinösen Arthritis des benachbarten Fesselgelenkes bei zwei Färsen. Bei einer Färse hatte sich die Osteomyelitis vermutlich infolge hämatogener Streuung im Anschluss an eine Bronchopneumonie, bei der zweiten Färse hatte sich die Osteomyelitis posttraumatisch entwickelt.

In beiden Fällen konnte mit Hilfe der Ultraschalluntersuchung (7,5 MHz-Linearschallkopf) ein mittelgradiger Erguss der dorsalen und palmaren Rezessus des Fesselgelenkes sowie eine hochgradig raue und unregelmäßige Kontur mit Knochenusur und periostaler Knochenzubildung im Bereich der distalen Wachstumsfugen des Metakarpus nachgewiesen werden. Die Röntgenuntersuchung zeigte unklar abgegrenzte, umfangreiche osteolytische Zonen epiphyseal und metaphyseal an der Wachstumsfuge des distalen Metakarpus.

Die chirurgische Behandlung wurde unter Sedation und regionaler intravenöser Stauungsanästhesie durchgeführt. Nach Schaffung eines chirurgischen Zuganges zum osteomyelitischen Herd im Bereich der Wachstumsfuge erfolgte ein Debridement mittels gründlicher Kürettage des infizierten Knochens, eine Arthrotomie des Fesselgelenkes sowie wiederholte Spülungen der Knochenhöhle und des Gelenkes. Zudem wurde eine systemische und lokale antibiotische Therapie, letztere unter Applikation einer regionalen intravenösen anti-

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biotischen Perfusion und einer intraartikulären und lokalen Antibiose vorgenommen. Eine antiphlogistische Behandlung mit NSAID's, eine zeitweilige Applikation eines PVC-Stützverbandes an der operierten Gliedmaße sowie eine separate postoperative Aufstallung der Patienten führten letztlich einen guten Behandlungserfolg.

**Schlüsselwörter:** Knocheninfektion, Wachstumsfuge, Arthritis, Ultraschall, Radiologie, Rind..

## Introduction

Osteomyelitis refers to an inflammatory or infective process of the bone marrow and cortex<sup>5,10,29,36</sup> due to direct inoculation, dissemination from adjacent foci or haematogenic spread of bacteria.<sup>3-6,10,11,13,15,16,22,33-37</sup> The predilection sites for bovine osteomyelitis are the distal metacarpal/metatarsal and distal tibial metaphysis/epiphysis (type-1 osteomyelitis), but it can also develop in other growth plates.<sup>6,10,11,24,37</sup> Affected cattle show lameness and unilateral swelling located at the growth plate level, which is frequently misinterpreted as arthritis, or they show a more diffuse swelling of the complete joint region if a concurrent arthritis develops.<sup>9,13,16,24,36</sup> Ultrasonography and radiography are crucial for the diagnosis of osteomyelitis.<sup>4,21,29,32,37</sup> Except for early cases of osteomyelitis, which may recover exclusively using prolonged systemic antimicrobial ther-

apy,<sup>10,13,36</sup> the treatment of choice is surgical debridement combined with application of local and systemic antibiotics and non-steroidal antiinflammatory drugs (NSAIDs).<sup>7,10,15,19,22,24,25,36</sup>

This report describes the clinical, ultrasonographic, radiographic, cytologic and bacteriologic findings and the surgical management of osteomyelitis of the metacarpal growth plate with concurrent serofibrinous arthritis of the MCP joint in two heifers.

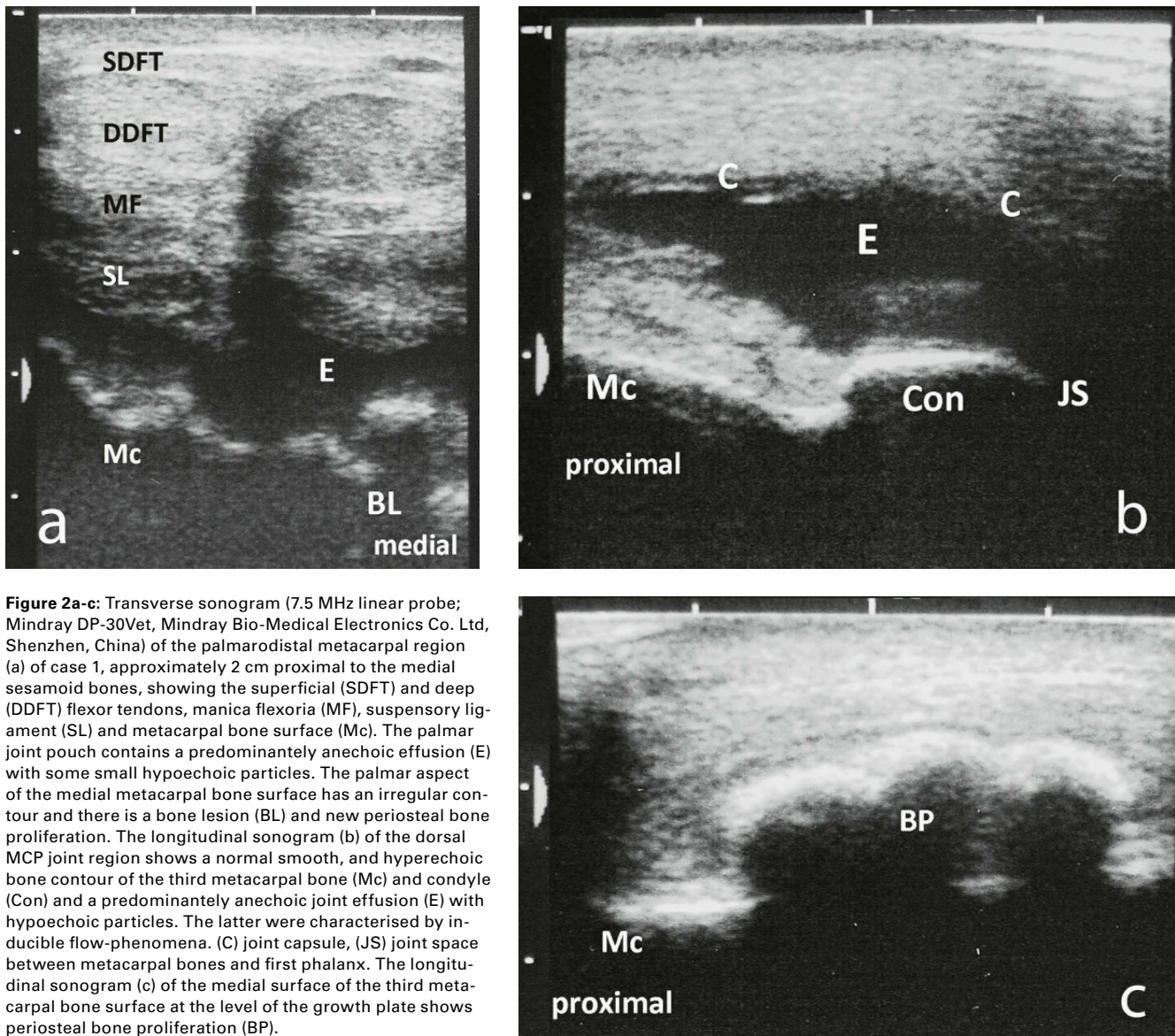
## Case 1

A twelve-month-old Holstein-Friesian heifer (265 kg) was presented five weeks after resolution of bronchopneumonia for progressive fetlock swelling and lameness present for 21 days. Clinical and lameness examinations revealed a large swelling predominantly localized at the medial aspect of the left MCP joint (Fig. 1) and a locomotion score of 3/5<sup>30</sup> attributable to lameness in the left forelimb. Vital signs were within normal limits. The affected region was examined ultrasonographically<sup>18,21</sup> and radiographically<sup>21,32</sup> and findings are described in the legends of Figs. 2 and 3. Arthrocentesis of the palmar MCP joint pouch<sup>20</sup> yielded a yellow-reddish, slightly turbid synovial fluid with a total nucleated cell count (NCC) of  $11,500 \times 10^9$  cells/L, 55% neutrophils and a protein concentration of 32 g/L, with negative bacteriological culture. Additionally, a tissue sample taken from the growth plate showed a negative bacteriological culture. Based on these findings, septic haematogenous metaphyseal/epiphyseal osteomyelitis of the growth plate of the third metacarpal bone with concurrent serofibrinous (but not necessarily septic) arthritis of the MCP joint was diagnosed.

The osteomyelitic lesion was surgically debrided and an arthrotomy of the MCP joint was carried out to access the palmaromedial pouch<sup>31</sup> (Fig. 4a) under sedation (Xylazine: 0.05 mg/kg i.v., Sedaxylan® 20 mg/ml – Injektionslösung; Eurovet Animal Health BV, Bladel, The Netherlands) and regional intravenous anesthesia (RIVA) (30 ml of 2% procaine hydrochloride: Procamidol® 20 mg/ml Injektionslösung, Richter Pharma AG,



**Figure 1a, b:** Dorsal (a) and medial (b) view of the left MCP joint region of case 1 showing prominent swelling over the medial and proximal aspects of the MCP joint (white arrow).

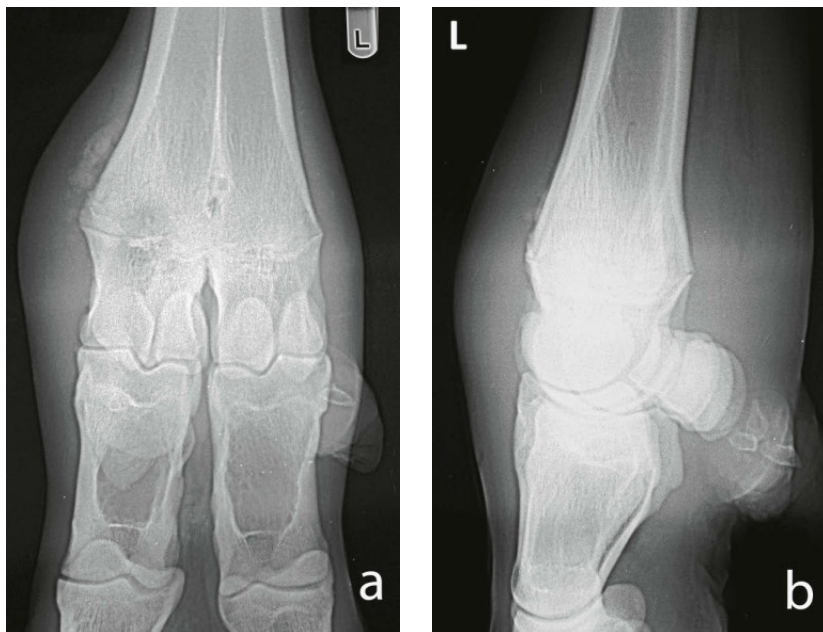


**Figure 2a-c:** Transverse sonogram (7.5 MHz linear probe; Mindray DP-30Vet, Mindray Bio-Medical Electronics Co. Ltd, Shenzhen, China) of the palmarodistal metacarpal region (a) of case 1, approximately 2 cm proximal to the medial sesamoid bones, showing the superficial (SDFT) and deep (DDFT) flexor tendons, manica flexoria (MF), suspensory ligament (SL) and metacarpal bone surface (Mc). The palmar joint pouch contains a predominantly anechoic effusion (E) with some small hypoechoic particles. The palmar aspect of the medial metacarpal bone surface has an irregular contour and there is a bone lesion (BL) and new periosteal bone proliferation. The longitudinal sonogram (b) of the dorsal MCP joint region shows a normal smooth, and hyperechoic bone contour of the third metacarpal bone (Mc) and condyle (Con) and a predominantly anechoic joint effusion (E) with hypoechoic particles. The latter were characterised by inducible flow-phenomena. (C) joint capsule, (JS) joint space between metacarpal bones and first phalanx. The longitudinal sonogram (c) of the medial surface of the third metacarpal bone surface at the level of the growth plate shows periosteal bone proliferation (BP).

Wels, Austria). Additionally, an intravenous regional limb perfusion (IVRLP) with 400 mg of gentamicin (Gentavan® 50 mg/ml – Injektionslösung für Tiere, Vana GmbH, Vienna, Austria) was administered. Precise orientation for surgical approach was determined using preoperative ultrasound in combination with the radiographs. The surgical sites were copiously flushed with 5 L of 0.9% saline solution (Physiologische Kochsalz-Lösung 0.9%, Fresenius Kabi, Graz, Austria) containing 0.1% povidone-iodine (Vet-Sept Lösung 10%®, aniMedica GmbH, Senden-Bösesell, Germany). At the end of the procedure, ampicillin<sup>s</sup> was infused into the joint and bone cavity (10 ml and 5 ml respectively). Access to the bone cavity was partially closed with simple interrupted sutures using silk (Silk fibre, 4 USP, Resorba, Nürnberg, Germany) (Fig. 4a). Polyurethane soft foam (Ligasano® polyurethane-soft-foam; Ligamed medical products GmbH, Cadolzburg, Germany) was

used as both passive drain material for both surgical approaches and as dressing to cover the wound.<sup>23</sup> A PVC-splint bandage was applied, which extended from the claws to the proximal metacarpal bone (Fig. 4b). The heifer was housed in a well-bedded recovery pen.

During the peri- and post-surgical periods, the heifer was treated with 10 mg/kg ampicillin (Ampicillin “Vana”® 200 mg/ml – Injektionssuspension für Tiere, Vana GmbH, Vienna, Austria) i.m. once daily for fourteen days and 3 mg/kg ketoprofen (Rifen® 100 mg/ml, Richter Pharma AG, Wels, Austria) i.m. daily for three days. Joint and bone cavity flushing under RIVA and a second IVRLP (same medication and dosage as above) was repeated one and four days after surgery. The bandage, wound dressings and drains were changed at that time and subsequently twice weekly. The drain was finally removed seven days after surgery. Two weeks after



**Figure 3a, b:** Dorsopalmar (a) radiographic view (85 kV, 2 mAs, 100 cm film-focus distance, CR-system, Fuji, Tokyo, Japan) of case 1 showing a large radiolucent oval area of osteomyelitis of the growth plate of third metacarpal bone (type 1-osteomyelitis) and moderate mineralized periosteal bone proliferation at the medial contour of the third metacarpal bone at the level of the growth plate. Osteomyelitis cannot be seen in the lateromedial view (b) but there is mild periosteal bone proliferation at the dorsal metacarpal contour. Both radiographs show thickening of the soft tissue surrounding the fetlock joint but characteristic signs of septic arthritis are not seen.

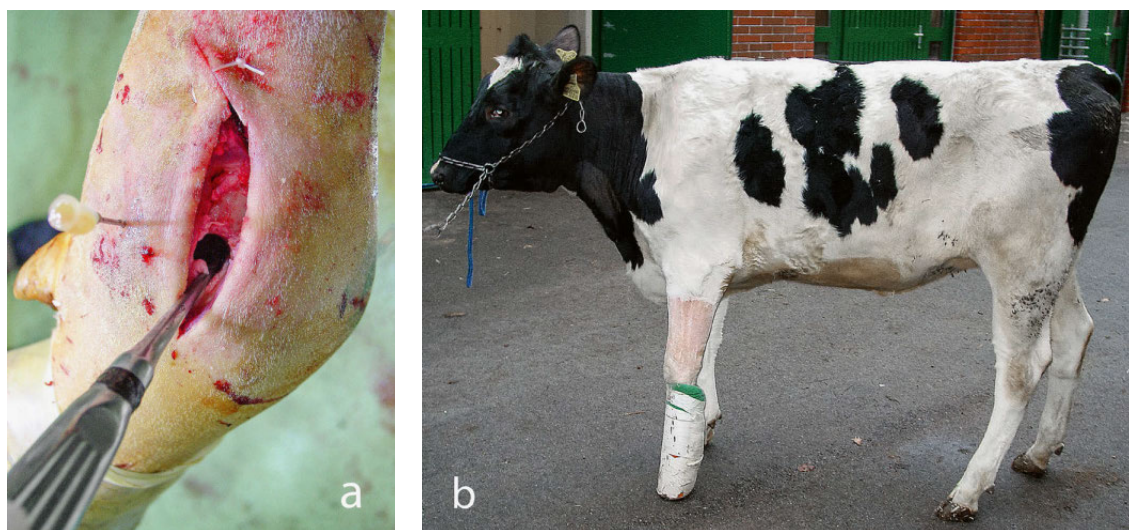
surgery the wound was completely covered with healthy granulation tissue (Fig. 5a) and the heifer had normal gait and limb conformation. Radiographs were taken at that time and findings were normal (Fig. 5b). The heifer was discharged from the hospital with the splint bandage seventeen days after surgery. After removal of the

bandage seven days later, the wounds were cleaned daily and an ointment (L-Mesitran® Ointment, Theo Manufacturing BV, 6200 AJ Maastricht, The Netherlands) was applied. Both surgical wounds were completely covered with new epithelium by four weeks after surgery. A telephone follow-up with the owner revealed that the heifer had a successful productive life and was eventually culled four years later because of infertility.

### Case 2

A 7.5-month-old Simmental heifer (232 kg) was referred for treatment of an infected wound at the level of the left lateral MCP joint region that had been present for 18 days. The heifer had been treated with penicillin i.m. for five days prior to admission. At clinical examination she showed a locomotion score 5/5,<sup>30</sup> moderate swelling of the MCP joint region and a 2 × 3 cm wound with purulent discharge at the lateral aspect (Fig. 6). A probe could be inserted to a depth of 2 cm and could touch the bone surface. The heifer had a body temperature of 39.8°C and a heart rate of 108 beats/min. All other clinical parameters were within normal limits. Ultrasonographic and radiographic findings are described in the legends of Figs. 7 and 8.

Arthrocentesis of the MCP joint<sup>20</sup> produced a yellow, turbid synovial fluid with a total NCC of  $15,000 \times 10^9$  cells/L, with 78% neutrophils and TP of 72 g/L. A wound swab yielded large numbers of *Escherichia coli* and moderate numbers of *Trueperella pyogenes* and *Proteus vulgaris* colonies sensitive to ampicillin, cefquinome, gentamicin, and enrofloxacin.



**Figure 4 a, b:** Intra-operative view (a) of the left medial MCP joint region of case 1 showing the surgical approach to the osteomyelitic lesion. The lesion was meticulously debrided using a curette. A turbid serous exudate was obtained when a hypodermic needle was introduced into the mediopalmar joint pouch. A PVC splint bandage was applied to the lower left forelimb (b), and one day after surgery, there was a moderate weight-bearing in the operated limb and the heifer stood with a flat back.



**Figure 5a, b:** Medial view (a) of the left MCP joint region of case 1, 14 days after surgery. The approach to the palmar joint pouch is to the left and the approach to the osteomyelitic lesion is to the right. Both wounds are completely filled with healthy granulation tissue, and the swelling has decreased significantly compared with the swelling shown in Fig. 1. The dorsopalmar radiographic view (b) taken 14 days after surgery shows normal healing of the demarcated bone cavity.

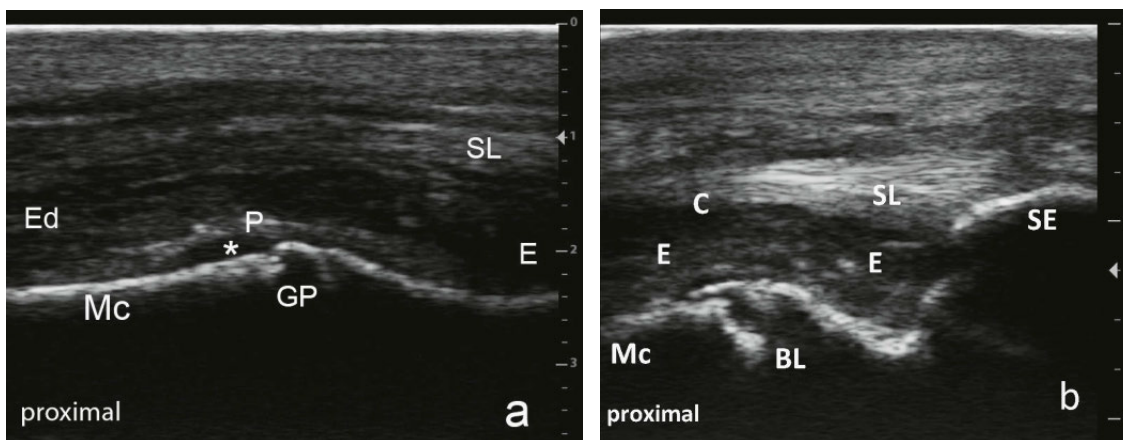


**Figure 6a, b:** Lateral (a) and dorsal (b) views of the left MCP joint region of case 2 showing a lacerated infected wound over the laterodistal aspect of the fetlock joint at the level of the growth plate sustained 18 days earlier. The dorsal and palmar pouches of the MCP joint are swollen.

On the basis of these findings, a metaphyseal/epiphyseal septic post-traumatic osteomyelitis at the level of the growth plate of the fourth metacarpal bone with concurrent serofibrinous arthritis of the left MCP joint was diagnosed.

The heifer underwent surgical debridement of the osteomyelitic lesion and arthrotomy of the MCP joint

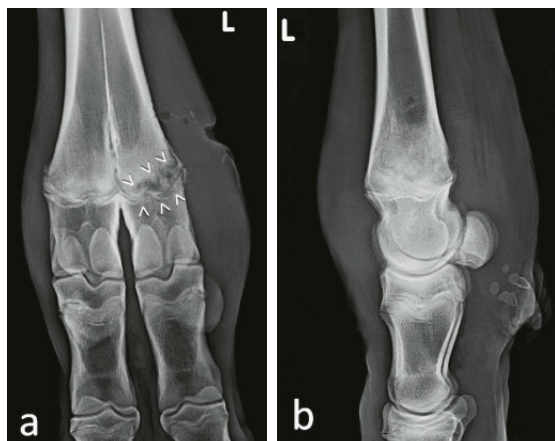
(Fig. 9a-c) using an approach to the palmarolateral and dorsomedial pouches.<sup>31</sup> The surgical procedure, anesthetic, medical and wound management were carried out as for case 1. However, 10 mg/kg ampicillin (Ampicillin “Vana“<sup>®</sup> 200 mg/ml – Injektionssuspension für Tiere, Vana GmbH, Vienna, Austria) i.m. was administered for 16 days. The wounds healed well (Fig. 9b) and were finally covered with healthy granulation tissue



**Figure 7a, b:** Longitudinal ultrasonographic view (7.5 MHz linear probe; Mindray DP-30Vet, Mindray Bio-Medical Electronics Co. Ltd, Shenzhen, China) of the dorsolateral MCP joint region (a) of case 2 showing early signs of osteomyelitis with thickening and displacement of the thin echogenic periosteum (P) from the fourth metacarpal bone (Mc) by anechoic exudate (\*) causing periosteal elevation at the level of the cartilaginous growth plate (GP). Longitudinal sonogram of the palmar aspect (b) of the fourth metacarpal bone and the MCP joint showing severe bone lesions (BL) with a highly irregular bone contour and depression of the bone surface at the level of the growth plate. Also imaged are the attachment of the abaxial lateral branch of the suspensory ligament (SL), a proximal sesamoid bone (SE) and the distended palmar pouch of the MCP joint with hypoechoic effusion (E) indicating serofibrinous arthritis.

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**Figure 8a, b:** Dorsopalmar (a) and lateromedial (b) radiographic views (85 kV, 2 mAs, 100 cm film-focus distance, CR-system, Fuji, Tokyo, Japan) of the MCP joint region of case 2 showing a radiolucent area with indistinct demarcation (arrows) involving large parts of the lateral epiphyseal/metaphyseal bone of the fourth metacarpal bone near the growth plate. There is severe soft tissue swelling, which is more pronounced at the lateral aspect of the fetlock. The notch at the surface of the skin is the wound, and the wound tract is outlined by gas pockets. The fetlock is swollen, but findings characteristic of septic arthritis are not seen.

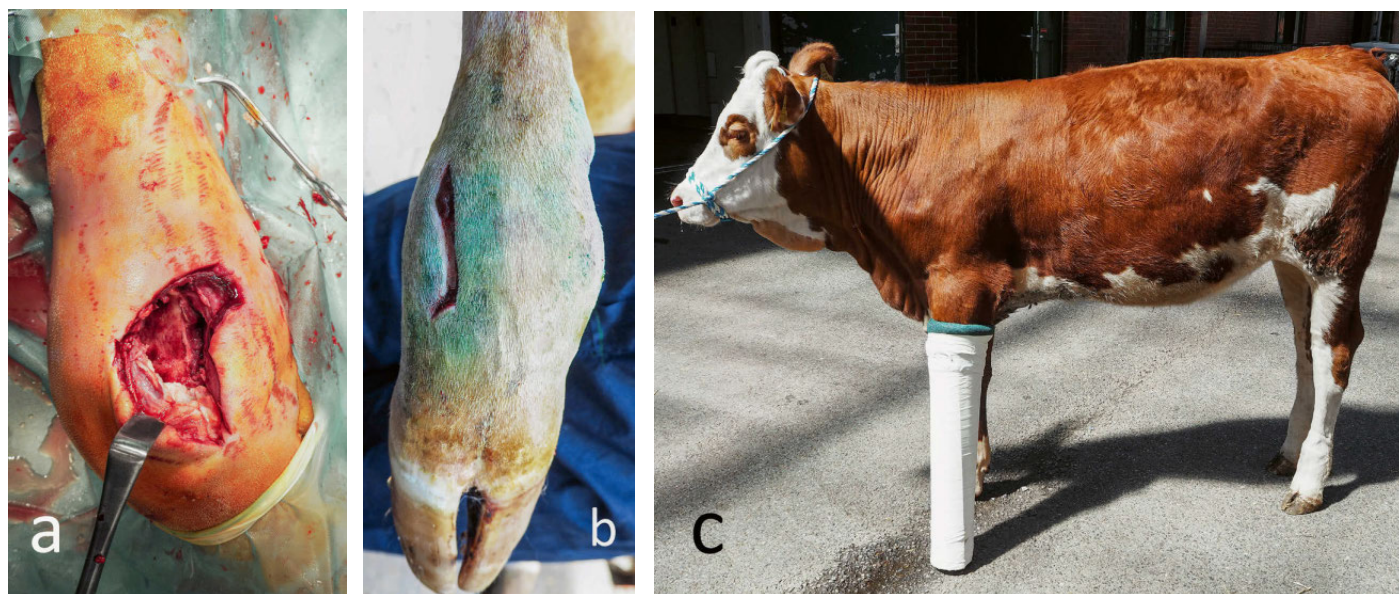
by day 28 (Figs. 10a,b). Radiographs taken 28 days after surgery confirmed the large bone cavity to be without any abnormality (Fig. 10c). The heifer was discharged 33 days after surgery with normal limb conformation and a locomotion score of 2/5. She was free of lameness four weeks later and the wounds were covered with new epithelium. The splint bandage was changed at the farm

once weekly for the following six weeks. At the time of this report, twelve months after surgery, the heifer had recovered well and was free of lameness, but there was a slight valgus deformation of 12° on the left and of 5° in the right forelimb. The heifer remained in the herd and had been inseminated.

## Discussion

This report features two heifers with osteomyelitis presented with similar clinical signs and radiographic findings.<sup>4,10,24,37</sup> One case likely resulted from haematogenous spread of bacteria while the second resulted from direct trauma. Haematogenous osteomyelitis has been reported to be 3.2 times more frequent than post-traumatic osteomyelitis; it occurs predominantly in the subchondral bone (type-2 osteomyelitis) and is accompanied by septic arthritis, or it may occur at the metaphyseal/epiphyseal bone close to the growth plate (type-1 osteomyelitis),<sup>37</sup> where blood flow is rich but sluggish.<sup>9,10,36</sup> Post-traumatic osteomyelitis frequently involves the digital and metacarpal/metatarsal regions<sup>37</sup> because they have a thin cover of protective soft tissue measuring a mere 10 mm or less.<sup>3,16,36</sup>

Osteomyelitis involving the growth plate can be suspected clinically, but its diagnosis without imaging techniques<sup>4,10,17,21,28,37</sup> is never definitive.<sup>10,24</sup> Growth plates in calves and young heifers can be imaged easily using ultrasonography, and they are commonly used as regional orientation landmarks. After identification of the



**Figure 9 a-c:** Intra-operative view (a) of case 2 showing the surgical approach to the palmarolateral joint pouch and the osteomyelitic lesion, which is meticulously debrided. A dorsal view (b) of the MCP joint 7 days after surgery shows that the wound resulting from the approach to the dorsomedial joint pouch is now completely filled with healthy granulation tissue. The heifer is shown seven days after surgery (c) with a PVC-splint bandage applied to the operated left forelimb and satisfactory weight-bearing.



**Figure 10 a-c:** Lateral (a) and dorsal views (b) of the MCP region of case 2, 28 days after surgery showing that the wounds from the approaches to the palmar joint pouch/osteomyelitic lesion and the dorsomedial joint pouch are completely filled with healthy granulation tissue. The swelling of the fetlock joint is greatly diminished compared with the findings at the time of referral (cf. Fig. 6). The dorsopalmar radiographic view (c) taken 28 days after surgery shows the large debrided bone cavity in the distal part of the fourth metacarpal bone.

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growth plate, the transducer is gradually moved in the longitudinal plane in a circular manner over the MCP joint region to permit complete circumferential outer growth plate visualization.<sup>12,17,18,21,28</sup> Early ultrasonographic signs of septic osteitis and osteomyelitis include thickening and displacement of the thin echogenic periosteal layer from the bone by an anechoic inflammatory exudate. This indicates periosteal elevation, which is a good indicator of early bone infection.<sup>5,17,18,21,28,29</sup>

Radiographic imaging is the method of choice for the diagnosis of osteomyelitis.<sup>4,21,29,32,37</sup> However, radiographs can be unremarkable immediately following trauma and in the early stages of osteolysis. At least 50 - 70% of bone must be demineralized before the lysis is radiographically distinct.<sup>13,29,37</sup> Therefore, ultrasonography may be more sensitive for the diagnosis of early stages of osteitis and osteomyelitis.<sup>4,17,18,21,28,29</sup> Early recognition of osteomyelitis by ultrasound and early treatment can prevent progression of infection and further pathological changes that are likely to develop if the diagnosis was based on radiographs alone,<sup>4</sup> and lead to a better outcome.

The choice of an antimicrobial should always be based on culture and sensitivity testing,<sup>1,7,8,13,25-27</sup> as demonstrated in case 2. The broad spectrum coverage provided

by a combination of ampicillin and gentamicin is considered a good choice for septic arthritis and osteomyelitis.<sup>13,15,27</sup> In osteomyelitis associated with bone necrosis and surrounding infected, ischemic and immune-compromised tissue, broad-spectrum bactericidal antibiotics may be the most effective.<sup>36</sup> Gentamicin is licensed for use in calves in Austria and the EU. It is water-soluble and economical,<sup>1,2,8</sup> making it ideal for IVRLP and intra-articular administration.<sup>15,27</sup> Additionally, compared with systemic use IVRLP ensures higher antibiotic concentrations where they are needed the most.<sup>13,35</sup> Alternatively, intraosseous antibiotic perfusion is a treatment option after debridement of osteomyelitic lesions.<sup>13,27</sup> Antibiotic-impregnated PMMA beads and gentamicin-impregnated collagen sponges have also been reported to be highly effective for the treatment of septic arthritis and osteomyelitis.<sup>13,14,27,33,34</sup> These products are more expensive and not licensed in the EU. The duration of the systemic antibiotic treatments used in the present report is in accordance with other studies.<sup>7,15,25,36</sup> However, antibiotic use alone is not sufficient. Meticulous debridement of devitalized bone, heavily contaminated or infected soft tissue and intra-articular fibrin is mandatory to improve access of antimicrobial agents to target sites.<sup>7,15,19,22,24-26,36</sup> Additionally, external coaptation during the postsurgical period, as with a splint bandage or a fiberglass cast, is recommended to avoid development of

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severe angular limb deformities and pathological fractures of the weakened bone.<sup>13,36</sup> The relatively high costs associated with the examination and medical and surgical treatment of the two heifers was justified considering the excellent outcome in both cases.

## Conclusions

Chronic septic osteomyelitis and concurrent serofibrinous arthritis of the MCP joint are serious disorders requiring surgical treatment. Curettage of chronic osteomyelitis lesions at the metacarpal growth plate combined with arthrotomy of affected MCP joints and repeated lavage associated with medical care proved to be effective in these cases. Adequate systemic and regional antibio-

tic treatment using IVRLP, intra-articular and intralesional treatments, pain management, temporary external coaptation of the affected limb and adequate postsurgical housing were important contributions to successful outcomes. The time interval from the onset of lameness/occurrence of trauma to the final diagnosis of osteomyelitis was delayed, which is typical for cattle with this condition. Consequently, the authors recommend that bovine practitioners employ rectal ultrasound probes for clinical work-up of patients with joint swelling. Diagnostic ultrasonography is a readily available tool that permits differentiation of implicated soft tissues, identification of potentially damaged bone surfaces attributed to osteomyelitis and a more comprehensive diagnosis at a much earlier stage of infection than radiography, and increases the chances of a successful outcome.

## Prise en charge chirurgicale de l'épiphysite septique métacarpienne et de l'arthrite sérofibrineuse du paturon concomitante: 2 cas.

Les résultats cliniques, ultrasonographiques, radiographiques, cytologiques et bactériologiques, le diagnostic et le traitement chirurgical de deux génisses atteintes d'épiphysite septique métacarpienne (ostéomyélite de type 1) et d'arthrite sérofibrineuse concomitante de l'articulation métacarpo-phalangienne (MCP) sont décrits. L'ostéomyélite était probablement due à une propagation hémotogène après une bronchopneumonie chez une génisse et s'était développée post-traumatiquement chez l'autre. Chez les deux patients, l'examen échographique avec une sonde linéaire à 7,5 MHz a révélé un épanchement modéré dans les récessus palmaire et dorsal de la capsule articulaire métacarpo-phalangienne ainsi que des contours osseux très irréguliers avec dépression et formation de nouvel os périosté au niveau de la ligne d'épiphyse métacarpienne. Les radiographies ont révélé une zone radio-transparente étendue avec des marges mal définies au niveau de la ligne d'épiphyse métacarpienne.

Le traitement chirurgical a été réalisé sous sédation et anesthésie régionale par voie intraveineuse. Il consistait en un débridement méticuleux de la lésion d'ostéomyélite au niveau de l'épiphyse métacarpienne associé à une arthrotomie de l'articulation métacarpo-phalangienne et à un lavage répété de la cavité articulaire. Des résultats positifs ont été obtenus par l'utilisation combinée d'antibiotiques systémiques et loco-régionaux, d'AINS, d'une coaptation externe temporaire et d'un logement adéquat.

**Mots-clés:** infection osseuse, plaque de croissance, arthrite, échographie, radiographie, bovin.

## Trattamento chirurgico dell'osteomielite settica delle epifisi del metacarpo con artrite sierofibrinosa dell'articolazione del nodello in due casi.

In questo studio vengono descritti i risultati clinici, sonografici, radiografici, citologici e batteriologici, la diagnosi e il trattamento chirurgico di due giovenche affette da osteomielite (OM di tipo 1) dell'epifisi del metacarpo associata ad un'arthrite sierofibrinosa dell'articolazione metacarpo-falangea (MCP). L'OM si è probabilmente verificata per diffusione ematogena a seguito di una broncopneumonia in un animale e come risultato post-traumatico nell'altra giovenca. In entrambi i casi, l'esame ecografico con la sonda lineare da 7,5 MHz ha rivelato una moderata effusione MCP delle sacche articolari palmare e dorsale e contorni ossei altamente irregolari con depressione e formazione ossea periostale nella epifisi metacarpale. Le radiografie hanno rivelato un'ampia area radiolucida con margini scarsamente definiti a livello della epifisi metacarpale. Il trattamento chirurgico è stato eseguito sotto sedazione e anestesia endovenosa locale e ha comportato uno sbrigliamento meticoloso della lesione OM dell'epifisi metacarpale combinato con artrotomia dell'articolazione MCP e ripetute irrigazioni della cavità ossea e dell'articolazione. I risultati positivi sono stati ottenuti grazie all'uso combinato di una terapia antibiotica sistemica e locale, un trattamento con FANS, l'applicazione temporanea di una fasciatura di supporto sull'arto operato e una stabulazione adeguata degli animali.

**Parole chiave:** infezione ossea, placca di crescita, artrite, ecografia, radiografia, bovini.



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