Severe infantile wrist empyema due to dental bacteremia

Kindliches Handgelenksempyem nach dentogener Bakteriämie

Abstract

Pediatric wrist empyema are very rare, this is the first case report in the current literature describing a hematogenic spreading of bacteria from dental caries, leading to a severe wrist empyema.

Keywords: wrist empyema, childhood, dental bacteremia

Zusammenfassung

Kindliche Handgelenksempyeme sind sehr selten. Dies ist in der aktuellen Literatur die Erstbeschreibung einer hämatogenen Streuung von Bakterien aufgrund eines kariotischen Zahnstatus, die zur Ausbildung eines schweren Handgelenkempyems geführt hat.

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Introduction

Any kind of infections of the pediatric hand are very rare and mostly due to traumatic injuries with open wounds following invasion of bacteria. In comparison to adults, hematogenic spreading of bacteria in the infant usually do not manifest within joints.
This first case report in the current literature describes a hematogenic spreading of bacteria from dental caries, leading to a severe wrist empyema.

Case presentation

A 5-year old healthy boy complained about increasing wrist pain for 10 days. There was no evidence or history of trauma, especially no signs of a penetrating trauma, which was plausibly negated from the mother as well. The parents consulted a pediatric surgeon twice; a non-suspicious X-ray and ultrasound were performed. With the diagnosis of wrist-contusion, no specific therapy was initiated.
Admittance to our department followed with progressive pain combined with swelling, redness and hyperthermia of the hand. An open wound of the hand was not detectable and due to pain and swelling no active motion was possible (Figure 1A).
The boy was febrile with 40.8 °C and in a reduced general condition. CRP was 69.2 mg/l and leukocytes were 20,000/nl. Blood cultures were negative.
Except for a cariotic dental status, associated with periodontitis (Figure 1B), the physical examination did not reveal further pathological findings. A second X-ray remained without any further findings.
Immediate operative treatment was initiated. Via dorsal approach we found a massive wrist empyema, which perforated into the carpal tunnel (Figure 2A, Figure 2B). A radical debridement was performed and almost the entire dorsal wrist capsule had to be removed (Figure 2C). Fortunately no signs of osteitis were found and the cartilage looked healthy after flushing the joint. We decided against a splinting with an external fixation and inserted antibiotic chains followed by open wound treatment with antiseptic dressings and cast splinting of the hand. A second look was performed two days later, with a clear reduction of the infection parameters. A calculated systemic antibiotic treatment was first performed with ampicillin/sulbactam and was continued in adaption to the antibiogram with cephalosporin after the proof of group A streptococci in the microbial swab. Immediately after the operation, fever and laboratory signs of infection were regressive, and the general condition of the boy stabilized.
Four days after the primary operation, secondary wound closure was achieved by local skin-distension flap and all wounds healed without problems (Figure 2D). Intensive physical therapy in combination with lymph-drainage and a compression glove was initiated and a full range of motion of the fingers could be obtained. Only the wrist-flexion remained impaired with only 20 degrees – which is not surprising due to the removal of the dorsal capsule – but the boy compensates very well.
Since no signs of an angina were present nor have been present in the past due to the anamnesis of the parents, we consulted a dentist looking for a focus of this severe

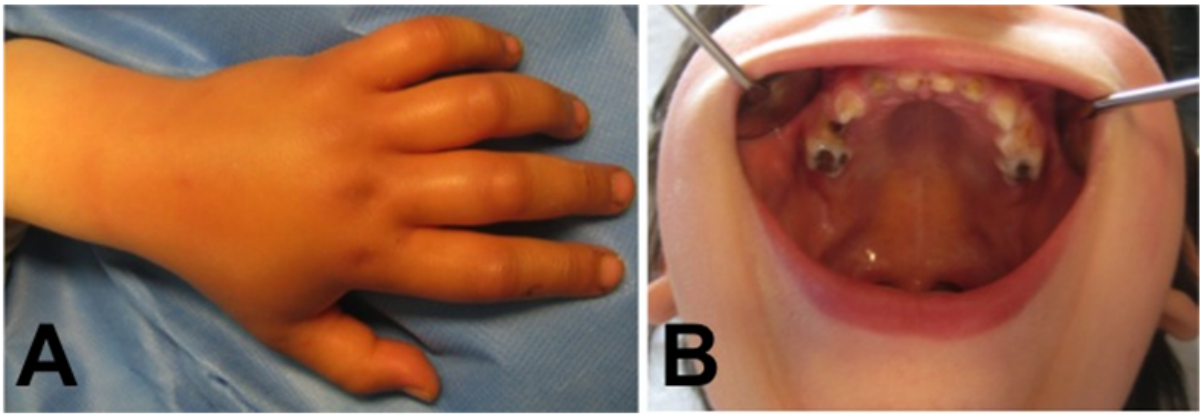

Figure 1: A: Clinical aspect of the left hand with swelling and redness, B: Unkempt dental status at the upper jaw with partially rotten teeth

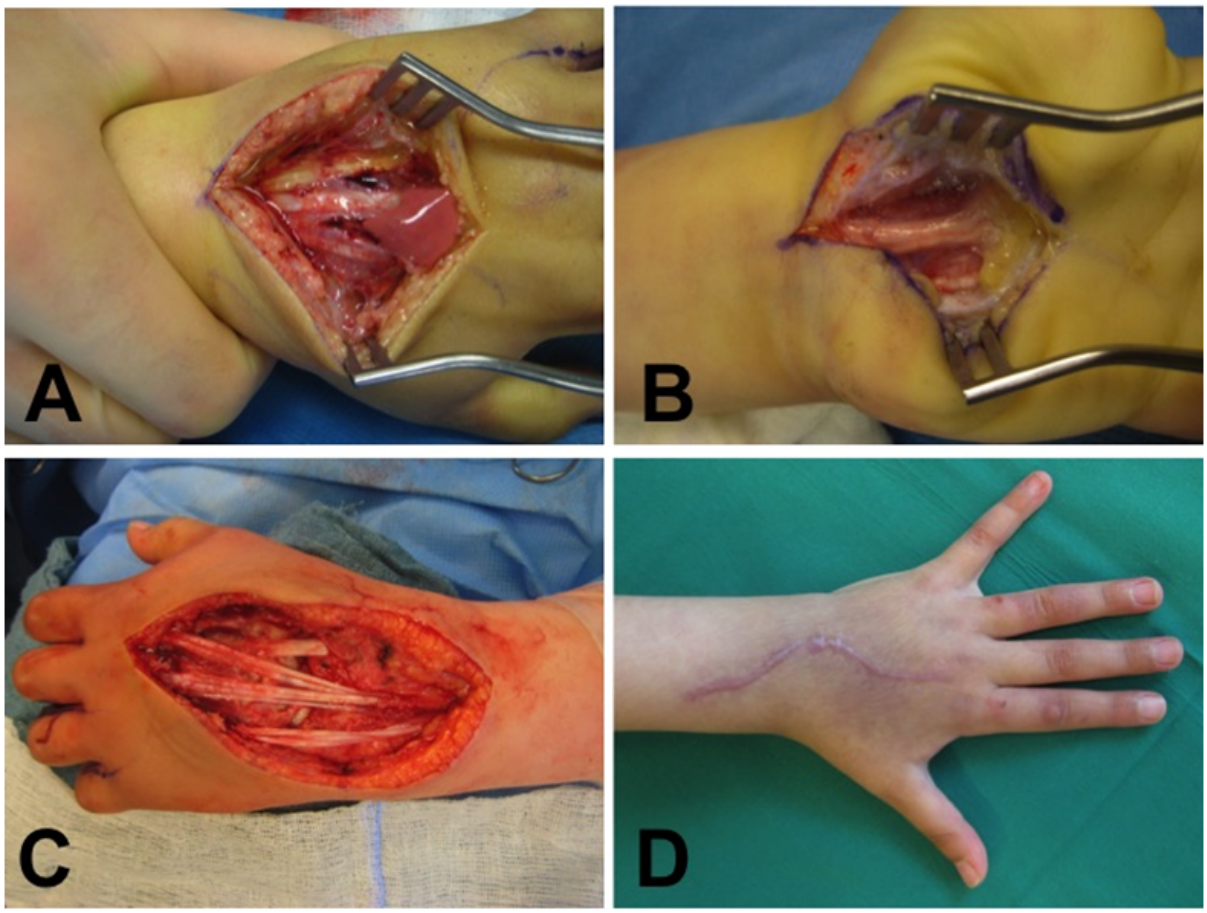

Figure 2: A: Dorsal approach to the wrist with pus leaking out of the joint, B: pus inside the carpal tunnel, C: Aspect after debridement and D: Result after 10 months

infection Soon afterwards altogether 8 teeth had to be extracted from the upper und lower jaw due to dental caries with destruction of the teeth and periodontic reactions. A microbial swab revealed the presence of the same streptococci-subtype in the extraction area as we found in the wrist. An echocardiography excluding endocarditis was performed.

Discussion

Hematogenic spreading of bacteria in children is very rare and if so, as in adults, a common result of bacteremia is an endocarditis [1]. Only few case reports describe an extracardial manifestation such as discitis and epidural abscess or mediastinitis [2], [3].

Of course, we cannot exclude a traumatic genesis, but this must have been an penetrating injury to the wrist, leading to an isolated wrist empyema – which is unlikely du to the fact that the parents negate such an rather

severe trauma and one would expect an subcutaneous infection as well. Furthermore, we did not find any other source of streptococci than the mouth and, disregarding the fact that streptococci are of course a colony-bacterium in the mouth, there was an infection of the teeth with the same subtype-bacteria than we found in the wrist. Therefore we believe in the hypothesis of a hematogenic spreading of streptococci leading to a wrist empyema and to our knowledge, this is the first report describing such a case.

Conclusions

A pediatrician should be alerted in any case of unspecific wrist pain in combination with an unkempt dental status. In the doubt, we recommend early admittance to a hand surgeon, since operative treatment and follow-up is difficult and of high importance in order to preserve adequate hand function.

Notes

Competing interests

The authors declare that they have no competing interests.

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