Response to the letter by Hamza Essaddam

As you have seen, our study had several objectives, one practical, which reported our experience in Oceania over a period of more than 20 years and sought to inform our colleagues of the therapeutic efficacy provided by the easy and rapid access to a positive diagnosis using “modern” imaging techniques, essentially ultrasound. This is all the more important that this exam is often the only recent means of investigation for the vast majority of the world’s population, particularly children. When, for the reasons advanced, ultrasound is not effective, CT with injection of contrast agent can replace ultrasound just as quickly. In our institution, the time to access and the complexity of implementing scintigraphy and MRI do not allow the rapidity and particularly the imaging definition desired to accelerate optimal patient management. This early access to diagnosis, based on efficient medical logistics that ensure that children are cared for from the first day of disease, associated with instant visualization on imaging of periosteal elevation, pathognomic of this disease, has allowed us to organize the treatment accordingly and to nearly eradicate chronic osteomyelitis.

As for the other objectives—bacteriological, epidemiological, and physiopathological—Pr Essaddam’s compelling and valuable comments warrant reflection. However, we would like to emphasize how much we were influenced by our observations, whether they stem from a clinical or a paraclinical perspective or the therapeutic progress made of late, to arrive at the pathogenic theory that we propose. These observations have allowed us to state that the image of periosteal elevation was consistently the prime motivating factor in the focus on infection, i.e., in the very first hours. The simple incision of the periostium with evacuation of the infected serous or hematic collection in the very early stages, or purulent in the later stages, alone sufficed to obtain immediate pain relief and healing with no sequelae, without ever having had to turn to bone trepanation, which we consider a dangerous procedure. Trueta’s physiopathological diagram therefore does not seem to comply with, and even contradicts, our imaging and surgical results. This is why we believe that primary bone infection may involve essentially cortical bone via an external periosteal pathway and less through an intrametaphyseal attack. We found no publications in the literature demonstrating this initial specific role of the periostium in this childhood infectious disease. On the other hand, in a more advanced situation, in patients who are seen late, osteoporotic cortical destruction can result in the medullary cavity macroscopically communicating with the periostium, giving a riddled aspect to the cortex going as far as necrosis bathing in metaphyseal and extraosseous pus, remarkably well described by Lannelongue nearly two centuries ago.

In addition, our theory was reinforced by progress made in intraosseous vascular circulation, which plays an important role in bone physiology. Unfortunately, it has not been sufficiently studied because most of the research techniques on circulation are difficult to apply to bone [1]. Consequently, a number of poorly adapted assessment techniques that have been used in the past are contradictory in their results. We proposed the interesting study conducted by Chanavaz [2] because it was more recent (1995), using a more refined technique: strontium 85 explored with gamma spectrometry, which supported our study. Similarly, we could have cited Reichert’s research [3], which used the CO57 radioactive microsphere technique, the current gold standard [1] for intramedullary reaming for nailing procedures, destroying the entire medullary arteriovenous network including the internal portion of the cortical bone yet multiplying the intraosseous blood flow by six thanks to the periostium. However, over the past few years, the periostial system has been much more closely studied, given its proven importance in bone vascularization [1], but most particularly for the major destructive role it plays in osteoporosis [4] with some of these data potentially useful in the context of this infectious disease.

However that may be, today no appropriate technique exists that can be used in a clinical application, most particularly in this pathology, although the future holds promise with techniques such as positron tomography, infrared spectroscopy, radionuclide scans, laser, and echo-Doppler velocimetry. These technological advances, in both
microanatomy and the functional approach to vascularization of living bone, should make it possible to verify this theory of acute childhood osteoperiostitis.

References


J.-L. Labbé
Orthopedic and Traumatologic Surgery Dept, Nouméa Territorial Hospital, BP J5, Nouméa, New Caledonia
E-mail address: jl.labbe@cht.nc
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