and we thank the authors. However, we want to draw attention to a point from our own experience.

Although the value of obtaining a microbiological diagnosis is emphasized in this paper, we think that blood cultures should be more widely used in some cases, as outlined below.

Brucellosis constitutes a major health problem around the world, especially in Mediterranean countries. As the authors emphasized, brucellosis is the most common cause of spondylodiscitis in endemic areas and can account for nearly 50% of spinal infections.\(^1\)\(^2\) Brucellosis represents the predominant cause in some series from the Mediterranean Basin and the Middle East.\(^3\)\(^4\) Although isolation of \textit{Brucella} spp. from sterile body fluids remains the diagnostic gold standard, isolation is frequently hampered by their slow growth (up to 30 days). Moreover, these difficult and slow growth characteristics may lead to non-detection by traditional culture methods.\(^5\) \textit{Brucella} spp. are isolated most often from blood or bone marrow; however, in selected cases, isolation can be successful from urine, CSF, synovial fluid and biopsies of the liver, lymph nodes and other tissues. Some data suggest that the automatic blood culture system [BACTEC (BD Diagnostics) or BacT/Alert (bioMérieux)] can improve isolation of slowly growing bacteria such as \textit{Brucella} spp. Thus, the rapid detection of \textit{Brucella} spp. with the BACTEC system may lead to an earlier diagnosis and may improve patient management, especially in cases with small samples.\(^6\)\(^7\) Blood culture systems have been found to improve the yield of clinically significant isolates from normally sterile body fluids with reduced time to detection; they may be advantageous for isolation of fastidious microorganisms, such as \textit{Brucella} and \textit{Streptococcus pneumoniae}, especially from CSF and synovial fluid specimens.

If there is suspicion of brucellosis, bone biopsy material should be inoculated into blood culture bottles along with bone marrow. The relative lack of data in this area may be due to the technical difficulties.

As a result, we would like to add the following advice to this valuable review. In order to increase the chances of isolation, where possible, all samples available should be inoculated into blood culture bottles, especially in endemic areas. Blood culture systems may increase the chances of isolating fastidious microorganisms from scarce samples and should be recommended.

\textbf{Transparency declarations}

None to declare.

References

However, as early as 1959, Wiley and Trueta\textsuperscript{7} cast doubt on Batson’s theory with regard to the spread of infection to the spine on anatomical, pathological and clinical grounds. Using their own anatomical contrast studies, they found that the veins of the vertebral bodies could only be filled retrogradely using high pressures and postulated that the vertebral veins form predominantly a drainage system. Furthermore, the radiological findings in spondylodiscitis cases displayed the characteristic anterior metaphyseal vertebral lesions, which are rich in arterial but not venous supply. Similarly, the involvement of adjacent vertebrae is also suggestive of arterial spread in view of the bifurcation of the feeding arteries. Thirdly, in clinical cases of spondylodiscitis arising from a pelvic source, preceding symptoms of bacteraemia such as fever and rigors were commonly documented, suggesting systemic spread. Indeed, even in the initial clinical series of spondylodiscitis in support of Batson’s hypothesis, bacteraemia was often present as a result of a genitourinary focus.\textsuperscript{8} Wiley and Trueta’s view has since been echoed by many experts.\textsuperscript{9–12}

It is also our opinion that an arterial route of spread to the vertebrae appears much more plausible, even in cases with a genitourinary source of infection. Batson’s hypothesis will continue to form part of the medical student teaching for the role of the vertebral veins in the spread of prostatic metastases to the spine, but perhaps not for the spread of infection.

We also thank Akcam et al.\textsuperscript{11} for their input on the value of inoculating biopsy samples into blood culture bottles in order to increase the diagnostic yield of fastidious organisms, particularly Brucella.

Data from a number of studies suggest that the use of automated blood culture systems can improve the yield of clinically significant pathogens from normally sterile samples by 8\%–15\% when compared with standard and broth-enriched cultures.\textsuperscript{14,15}

It has been suggested that the yield of certain fastidious organisms causing septic arthritis such as Kingella kingae and Brucella may particularly benefit from inoculation into blood culture bottles, which also support more rapid growth compared with solid media.\textsuperscript{16,17} However, the numbers of Brucella cases in these studies were small and spinal biopsies were not included. We agree with Akcam et al.\textsuperscript{11} that it would be technically challenging to achieve the inoculation of bone tissue into blood culture bottles. Moreover, the relative merits of multiple biopsy specimens obtained from one infected site processed by routine cultures versus blood culture bottle inoculation is not clear. Manipulation of the sample during blood culture bottle inoculation also increases the possibility of contamination with, most commonly, skin organisms, which can make interpretation difficult. In the absence of a large comparative study it is difficult to recommend the routine inoculation of blood culture bottles with spinal biopsy material; we note that the British guidance on processing bone biopsies does not include the use of blood culture bottles, whilst that for the culture of bone marrow material recommends the use of blood culture bottles.\textsuperscript{18} We do, however, take note of the practices and experience from certain endemic areas\textsuperscript{19} and would welcome further evidence in support.

A molecular approach would be an alternative for the rapid diagnosis of fastidious organisms. From our own data in routine diagnostic microbiology, broad-range 16S rDNA PCR performed on 145 culture-negative samples yielded a clinically significant organism in 16.6\% of cases.\textsuperscript{20} This is similar to the figures of 17\%–21\% quoted in the literature.\textsuperscript{21,22}

For endemic areas where the suspicion of Brucella is high, a faster, cheaper and probably more sensitive method compared with 16S rDNA PCR is the use of Brucella-specific PCR. A recently described multiplex PCR targeting Brucella and Mycobacterium tuberculosis appears promising in this setting.\textsuperscript{23} The downside of molecular tests is currently the lack of susceptibility data and standardization, and possibly the pick-up of bacterial DNA long after the organisms have died.

Ultimately, the methods used will depend on local experience and resources. In cases of suspected spondylodiscitis, the emphasis must remain on obtaining appropriate diagnostic samples, ideally before antimicrobials are started.

Transparency declarations

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Letters to the Editor


