

Stress Fractures in the Juvenile Skeletal System

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Stress fractures affecting the juvenile skeletal system are rare and are described as having a good prognosis. Precisely because these fractures are so rare, studies allowing clear and generally applicable conclusions are lacking.

The object of the present study was a systematic analysis of patients with stress fractures in an immature skeletal system, with special reference to the frequently difficult and delayed diagnosis and to the forms of therapy considered appropriate.

Twenty-five patients with a total of 27 stress fractures affecting bones with the growth plates still open were examined according to a standardized procedure. The average duration of follow-up was 4.8 years (SD +/- 2.3) and the average age at occurrence 12.9 years (SD +/- 4.31).

The risk factors were largely the same as those in adults. The most frequent site was the tibia (48% of cases; n = 13), followed by the metatarsal bones.

Most (26/27) fractures were treated conservatively, with an average duration of therapy of 8.9 weeks (SD 8.2 weeks). Ultimately, 17 (63%) of the fractures healed in such a way as to allow the patients to return to full athletic activity with no restrictions within 3 months after diagnosis.

In 9 cases (33%) it was not possible to achieve complete absence of symptoms within 12 months after diagnosis was made. No pseudarthroses were observed.

There was a significant correlation between clinical outcome recorded as "free of symptoms" and an early diagnosis (less than 2 weeks after first symptoms ($p = 0.033$) and a fracture line seen on MR tomography in contrast to a stress reaction with merely increased signal intensity ($p = 0.037$).

Overall, a strikingly high proportion of these patients had a prolonged course. This is attributable partly to the delay in diagnosis and to inappropriate initial treatment.

When stress fractures were recognizable by a demonstrable fracture line--in contrast to just an edema--on MR tomography and their diagnosis was followed by an adequate form of therapy the chances of complete healing seemed to be better.

It is essential to carry out targeted imaging investigations, e.g., by means of MR tomography, when there is a reason to consider a stress reaction.

Furthermore, stress fractures should be adequately treated until all symptoms have disappeared.