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Percutaneous injection of synthetic tricalcium phosphate for the treatment of active simple bone cysts in children and adolescents

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Background: Fracture risk and probability of spontaneous healing of simple bone cysts is mainly related to the cyst activity and can be quantified with the cyst-index. The aim of our study was to evaluate the results after a minimally invasive treatment of active simple bone cysts with percutaneous aspiration, hydrogen peroxide lavage and injection of synthetic tricalcium phosphate.
Methods: We retrospectively included 21 patients (13.2 ±3 years) with 21 simple bone cysts (5 femura, 11 humeri, 5 calcanei) and 27 treatments at our department between 2006 and 2011. All patients were treated minimally invasive. At the femur, an internal fixation was performed prior to injection depending on size and location of the cysts. 13 patients presented with preceding fractures. At follow-up radiological healing (modified Neer classification), activity level, (re-) fracture, reinjection and complications were examined. The mean follow-up was 40 ±19.6 months.
Results: Partial or complete radiological response was observed in 81% after 13 ±3.4 months. After 1,5 months 95% of patients returned to unrestricted activity. In total 1 refracture (femur) as well as 2 (7%) wound infections were recorded and 5 patients (28%) required a second injection after 21 ±4.6 months. Of the latter, 3 showed healing after 12 ±0.3 months, 1 patient required a second injection with healing after 13 months.
Conclusion: The shown technique is a proper and minimally invasive option for the treatment of active simple bone cyst in children and adolescents. The use of injectable synthetic tricalcium phosphate provides primary stability especially at the upper extremity as well as the calcaneus and helps to avoid refractures. At the proximal femur additional stabilisation (e.g. elastic nails) is strongly recommended.