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## GIANT CELL TUMORS OF THE SMALL BONES OF HANDS AND FEET: LONGTERM RESULTS OF 30 PATIENTS AND LITERATURE REVIEW

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**BACKGROUND** Giant cell tumors (GCT) of small bones are rare (5%) and may behave more aggressively than GCT of long bones. Only few case-series are published, mainly single case-reports. Surgical treatment varies widely in literature, with highly variable recurrence-rates (0-100%). Study aims were to perform a systematic literature review and to evaluate outcomes after different surgical techniques.

**METHODS** First, we included twelve papers (from 775 titles) with more than two patients. Titles, abstracts and full-text papers were reviewed by two reviewers. Average recurrence-rate was 72% (18/25; 0-100%) for curettage, 13% (2/15, 0-50%) for curettage with adjuvants and 15% (6/41; 0-50%) for resection. Second, we retrospectively reviewed 31 patients who underwent surgery for GCT of the small bones in one of five tertiary referral centers for orthopaedic oncology (1987-2010). One patient was excluded because of malignant GCT and we included 30 patients; the largest series on GCT of the small bones so far. Six patients underwent curettage, 18 curettage with phenol or liquid nitrogen, with or without polymethylmethacrylate (PMMA) and six resection. We evaluated recurrence and complication-rates, risk factors and functional outcome.

**RESULTS** At a median follow-up of 5 years (range 2-22) recurrence-rate was 50% (3/6) after curettage, 22% (4/18) after curettage with adjuvants and 17% (1/6) after resection. Five-years estimated recurrence-free survival (Kaplan-Meier) was 50% for curettage, 75% for curettage with adjuvants and 80% for resection (Log-rank; p=0.423). The only complication was pain (1/30) which resolved after surgical removal of PMMA remnants. We could not identify individual factors correlated to higher recurrence or complication risks. Mean Musculoskeletal Tumor Society (MSTS) scores were slightly higher after intralesional treatment (29 (20-30)) and resection (25 (18-30)) (p=0.091).

**CONCLUSION** In this largest series on GCT of the small bones, we report the lowest recurrence-rate for resection, followed by curettage with adjuvants. No risk factors for recurrence or complication were identified. Functional outcome may be impaired after resection but was comparable after all techniques in this series. Repeated curettage with adjuvants finally resulted in cure of all patients and is therefore a feasible treatment option in both primary and recurrent GCT of the small bones.

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