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CASE REPORT

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Humeral lengthening using a retrograde motorized intramedullary lengthening nail

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An elite-level 13-year-old female overhead athlete, with a previous history of bone cyst and fracture at age 8, presented with a humeral length discrepancy of 75 mm which had increased to 81 mm within 1 year. Antegrade correction with a motorized lengthening nail was considered but declined due to risk of shoulder damage and pain. In an off-label manner, a femoral motorized lengthening nail was modified and utilized with retrograde placement. Lengthening instructions were modified weekly to account for rapid humeral growth, to minimize soft-tissue tension, and to maximize regenerate quality. By 11 weeks, humeral length was clinically corrected. Three weeks after ceasing lengthening, full range of motion of the shoulder and elbow returned. Once the site had formed new cortex on all four sides, the nail was removed, and return to full activity occurred 4 months later.

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