CASE REPORT

Treatment of enchondroma pathological radial and ulnar fracture in a child with Ollier’s disease

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Enchondroma is a benign intramedullary cartilaginous neoplasm of bone, which is usually located in central metaphysis. In one study it was shown that 57% of patients with enchondromas were between 11 and 30 years of age. In decreasing order of frequency, most common sites affected are the phalanges, metacarpals, metatarsals, humerus and femur. It is known that 15% of children who have one or more pathological fractures due to enchondroma go on to delayed union or non-union.7 As for the treatment asymptomatic lesions can be observed. However, if the identity of the lesion is uncertain then biopsy is justified. If the lesions are symptomatic then these patients respond well to curettage and bone grafting.2 Suggested treatment for long bones is fixation.9 So far we have found only one case report of pathological fracture (due to enchondroma) fixation of radius in an adult where plate fixation with bone grafting was used.8 In that study there was a satisfactory healing at 9 months.8 To the author’s knowledge this is the only case report of an enchondroma fracture treatment of both radial and ulnar metaphysis in a child with Ollier’s disease. No study so far has been performed to show the follow up result of these patients. In this case report we aim to show a 30 months follow up result of an 11-year-old girl with enchondroma pathological fracture of the ulnar and radial bone where radial metaphysial fracture was fixed with plate fixation while ulnar pathological fracture was not fixed.

Case report

An 11-year-old girl presented to the Emergency Department with painful, deformed left forearm following a fall from the horse. There was no neurological deficit. The forearm radiograph showed transverse fracture of the distal metaphysis of the left radius and ulna (Fig. 1). The patient was treated with plate fixation of left distal radial fracture while left distal ulnar fracture was not fixed (Fig. 2A and B). No bone grafts were used during the internal fixation. The satisfactory ongoing healing has been noted 6 weeks postoperatively (Fig. 2C and D) then at 1 and 2 years in Fig. 2E and F and Fig. 2G and H, respectively. Note that the ulnar fracture healed without internal fixation. The histology of sample taken at the time of the operation showed enchondroma (Fig. 3). At 30-month follow up after treatment patient had no associated problems. She is back playing all normal sporting activities. The decision was made for the plate to be removed when the patient reaches skeletal maturity and not before to avoid the risk of refracturing.
Radiology

Histology

Macroscopy: four bony fragments 4–7 mm max diameter. The specimen comprises four small fragments of modestly cellular hyaline cartilage showing partial bony encasement. Microscopy (Fig. 3): the chondrocytes have small, hyperchromatic nuclei. No binucleate forms or cells with significant atypia are seen. There is fibrin deposition on the surface of the cartilage in places, possibly related to the history of fracture. The cartilage is focally calcified. The histological features, taken together with radiographs which show a fracture through an intramedullary lesion in the left radial diaphysis, are in keeping with an enchondroma.

Discussion

Enchondroma involving ulna and radius are very rare (1%). Asymptomatic enchondromas usually occur in the hand while enchondromas of long tubular bones are frequently painful. Radiographic appearance of enchondromas commonly shows a lytic lesion with pin-head-size calcifications. Forearm fractures in children are common and due to the remodelling potential in children before 8 years of age, the treatment is most commonly by non-operative methods. However, surgical treatment of forearm fractures of children include unstable fractures, open fractures, fractures with neurovascular injury and pathologic fractures, e.g. enchondroma. The options for surgical treatment of diaphysial forearm fractures are plate fixation and open or closed intramedullary nailing techniques. As the plate fixation necessitates stripping of periosteum, there is an increased risk of non-union, pseudoarthrosis and infection rate, while intramedullary nailing is advantageous as it is less invasive, ease of reapplication, no further metal removal and low rates of complications. A previous case report has shown satisfactory healing of an enchondroma radial diaphysial fracture in an adult treated with plate, screws and bone grafting. Our case report shows that children with enchondroma metaphysial fractures do well with only internal fixation without the need for bone grafting which may lead to prolonged operation time as well as further risks associated with obtaining the bone graft. Interestingly, enchondroma pathological fracture of ulna healed satisfactorily without fixation and the remodelling capacity of such fractures in children seems to be preserved. We recommend that enchondroma pathological fractures of radius and ulna in children should be treated no different than any other fractures in children with a view that if symptoms persist than at a later stage curettage and bone grafting is advised. We suggest that further studies should be made regarding remodelling potential of enchondroma fractures of long bones in children.
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- Patient and her family for kindly allowing us to submit this case report for publication.
- Ms. Neera Singh (Department of Radiology, Kingston Hospital) for providing us with the radiological images of the patient.

Figure 2  Serial radiographs (anterior–posterior and lateral views) post-fracture internal fixation of radius showing that the fractures have healed satisfactorily. (A and B) 1 day post-operatively; (C and D) 6 weeks post-operatively; (E and F) 1-year post-operatively and (G and H) 2 years post-operatively.

Figure 3  Histopathology image of the biopsy specimen of the patient’s lesion taken intra-operatively showing cartilage in-growth within the bone consistent with enchondroma.

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• Dr. Kaushik Patel, Department of Pathology and Histopathology, Kingston Hospital for providing us with the histopathology images.

References