

Enchondroma of the hand-Treated by curettage and bone grafting

B.Punithavasanthan¹, Tanuj Kanti Chaudhuri², Nongthon singh³, Khoda Tada²

¹Senior Resident, Department of Orthopedics, Regional Institute Of Medical sciences, Imphal

²Postgraduate trainee, Department of Orthopedics, Regional Institute Of Medical sciences, Imphal

³Professor, Department of Orthopedics, Regional Institute Of Medical sciences, Imphal

Corresponding Author: B.Punithavasanthan

Abstract

Background: Enchondroma of the hand is a rare benign tumor composed of mature cartilage. The treatment for this tumor type is usually surgery. Surgery includes curettage, curettage with bone grafting or bone cement.

Materials and methods: This prospective study involves 11 patients with enchondroma of hand operated by curettage and autologous bone grafting between May 2015 to May 2017.

Results: 10 patients had no restriction of movement, while 1 patient had a flexion deformity of 10 degree. No patient had any local tumour recurrence or residual swelling.

Conclusion: We conclude that curettage followed by autologous bone grafting is a very good method of treating enchondroma of hand.

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I. Introduction

Enchondroma of the hand is a rare benign tumor composed of mature cartilage. The age of the patients varies widely^{1,2,3}. The tumor arises in the medullary cavity and grows into the cortex, forming a prominent endogenous mass in the bone⁴. Common symptoms of presentation include pain, swelling, deformity and pathological fracture at the site of tumour. The small bones of the hand are the most frequent anatomic site for enchondromas with approximately 40% of the cases occurring at this site⁵. These lesions are most frequently located in the proximal phalanx, followed by the middle phalanx, metacarpals, distal phalanx, and, rarely, in the carpal bones^{6,7}. Malignant transformation enchondromas to chondrosarcoma is rare and is associated with a very low rate of metastatic dissemination⁸. The treatment for this tumor type is usually surgery. Surgical resection includes curettage, curettage with bone grafting, or amputation⁹. Tumor recurrence and malignant transformation represent <1% of cases¹⁰.

II. Materials and Methods

This is a prospective study done in the Regional Institute of Medical sciences –Imphal, between 2015 May -2017 May. 11 patients presented with enchondroma of hand was included in this study. 7 patients were male, and 5 patients had pathological fracture. 8 patients had enchondroma in proximal phalanx and 3 had in metacarpal bone. None of the patients had Ollier disease or Maffucci's syndrome.

III. Operative procedure

Under regional anaesthesia, tourniquet was applied, then either dorsal or midlateral (in case of pathological fracture) finger approach was used to expose the affected part. The overlying extensor tendon was exposed longitudinally and mobilized medially or laterally to expose the more involved aspect of the bone. A cortical window the size of the longest longitudinal dimension of the tumor was made to allow exposure of the entire tumor area and for better curettage. Then the tumor cavity was curetted thoroughly [fig.2] and washed thoroughly with normal saline. No high speed drilling or instillation of alcohol was used in our study. Then autologous bone graft was harvested from the iliac crest and put inside the tumor cavity. In case of pathological fracture [fig.3], fixation was done by K wire [fig.4]. All patients were given third generation cephalosporin antibiotics intravenously 45 minutes prior to surgery. Tumor materials removed intraoperatively was sent for histopathological examination. Postoperatively, intravenous antibiotics was given for 3 days. Patients without pathological fractures were advised to perform normal hand movements as tolerated from day 2. Unrestricted activity was allowed after 2 weeks. For patients with pathological fractures finger splints was applied for 3 weeks, After 3 weeks active finger movements was allowed as tolerated, K wire was removed at 4 week. By 5

weeks unrestricted hand movements was allowed. but patients were warned to avoid overexertion of the affected finger.

All the patients were followed up for one year. all the patients visited at 2 week, 1 month, 3 month, 6 month, 1 year. At each visit anteroposterior and oblique x-rays of the affected hand was taken and patients were checked for finger movements.



Fig.1 Xray of Enchondroma proximal phalynx of fourth finger with pathological fracture



Fig.2 Enchondroma cavity exposed and curetted.



Fig.3 Tumour cavity filled with autologous bone graft.



Fig.4 Pathological fracture fixed with k wire



Fig.5 Post operative x ray

IV. Results

After surgery there were no neurovascular or tendon injuries, no superficial or deep wound infections, no delayed stress fractures. Patients without pathological fractures returned to their pre-surgical functional capability by 5 weeks after surgery. In patients with pathological fractures bony union was achieved within 3 weeks. 10 patients had good range of motion in affected fingers. 1 patient had loss of flexion by 30 degrees at proximal interphalangeal joint. but no functional limitation was observed in him. At one year follow-up evaluation none of them had local tumor recurrence, residual swelling, or deformity. There was no complication in donor site. The report of tumor material send for histopathological examination from all cases came as enchondroma.

V. Discussion

Enchondroma of the hand, occurs most common in second to fourth decades, shows increased cellularity and nuclear atypia in comparison to other sites, but has a good radiographic appearance including central lucent lesion with symmetric cortical expansion, and without any cortical destruction or soft tissue extension¹¹. In comparison to this, hand chondrosarcoma commonly seen in fourth to sixth decades, has high histologic grade, apparent cortical destruction, and soft tissue extension^{12,13}. It's proved that chondrosarcoma of the hand is a locally aggressive lesion which in contrast to other anatomic sites, rarely metastasizes, and excellent local control maybe achieved after recurrence by reoperation^{14,15,16}. The distribution of tumors in decreasing order of frequency is proximal phalanx, metacarpals, middle phalanx, and distal phalanx¹⁷. Enchondromas of the hand can be effectively removed by means of curettage alone. In our study we did not use and high speed burr drill as the cavity of enchondroma is small and using high speed burr drill may cause soft tissue injury. we avoided using bone cement to fill up the tumor cavity because of the complications associated

with its use such as bone cement implantation syndrome and heat necrosis¹⁸. Bony defects and pathological fracture were treated using autologous bone graft harvested from iliac crest to fillup the tumour cavity, since the tumour cavity is usually small, minimal amount of bone graft(in our study one chip of bone graft) needs to be harvested from donor site. In our study none of the patients had any donor site complications.

Limitations

Limitations of this study was small number of cases (due to rarity of the disease)and single hospital bias and absence of controls.

VI. Conclusion

We conclude that treatment of enchondroma of hand using curetting and autologous bone grafting is a very effective method and using autologous bone graft from patients eliminates the complications associated with bone cement. Since the tumor cavity is small, so minimal amount of graft harvesting is usually sufficient.

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