An Interesting case of osteomyelitis of humerus with bone defect for management -Case report

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Abstract: BACKGROUND High rate of prevalence of chronic osteomyelitis in children is posed with lot of problems which makes it difficult to treat. One such case of chronic osteomyelitis humerus with bone defect is discussed here. AIM To get Good functional outcome in a 15 year old girl with chronic osteomyelitis humerus associated with bone defect. MATERIALS AND METHODS A 15 year old girl was admitted in our hospital with complaints of history of fall 1 yr back and injured left arm. She was not able to move her arm after fall for which she had native treatment with splinting for 3 months. She developed blisters in skin and discharging pus from left arm. Debridement was done and external fixator applied elsewhere. She presented to us with complaints of discharging sinus with arm in external fixator. Problems to be addressed in her are Chronic osteomyelitis with discharging sinus, Defect Non-union Proximal humerus, Subluxed Humeral head, avascular necrosis of humeral head, Limb length discrepancy of 6 cm (Acromion to lateral condyle), Hypothesia of skin over the area supplied by axillary nerve. Initial debridement after sending pus Culture and sensitivity was done. Antibiotics started according to the report. We waited till sinus became completely dry. Once three consecutive CRP normal levels were obtained we proceeded with surgical intervention. Surgically she was proceeded with a Non- Vascularised fibular Allograft, Augmented with cancellous iliac crest graft, Distally fixed the graft with LCP and proximally stabilised with K wire. Post-operatively arm was immobilized for two months. K wire was taken out at two months. Patient was on regular follow for one year. RESULT Girl had a good available range of motion, with Good Functional improvement able to carry out her daily routines.

Keyword: Chronic osteomyelitis, bone defect, Fibular graft

Full Text:
This is a case report of 15 year old child with history of fall injury 1½ yr back. She injured her left arm. Took native treatment in the form of splint. Developed blebs, blisters and discharging sinus after splint removal. Went to a nearby hospital where she was operated. As per the knowledge of the patient and mother first time the procedure was stabilization of arm with pins and rods with removal of a piece of bone.

Her initial Xrays showing chronic osteomyelitic of left humerus is given in Fig. (1.1, 1.2, 1.3).

Fig 1.1
Fig 1.2
Fig 1.3

Immediate post-op and first week post-op showing sequestrectomy and external fixator application done elsewhere are given in fig (2.1, 2.2)

Fig 2.1
Fig 2.2
Patient presented to Our hospital 1 ½ years later after initial injury with an external fixator over arm (Fig. 3) which was loose hanging and pins were removed. This is the clinical picture after removal of the external fixator (Fig. 4.1, 4.2) showing external fixator with no bony purchase, bone defect proximal humerus, subluxed humeral head and discharging sinus.

Fig 3

Fig 4.1

Fig 4.2

She was managed initially with removal of external fixator and debridement after sending pus culture and sensitivity with empirical antibiotics. Antibiotics were changed as per pus C/S report. ESR and CRP was repeated every two weeks. Once three consecutive CRP normal levels were obtained we proceeded with surgical intervention after waiting for three months to rule out persistent infection. Clinically also there was no pus discharge.

MRI was done (fig. 5) for the patient which showed a Non viable Head, Bone loss proximal humerus, Chronic osteomyelitis involving mid-shaft and distal humerus sparing condyles

Fig 5

Definite procedure
1) Involved use of Non- Vascularised fibular Allograft (Fig. 7) harvested from mother to fill the humeral defect2) The graft was proximally stabilised with K wire (Fig. 9 ) 3) Distally with LCP (Fig. 10)4) Augmented with cancellous iliac crest graft (Fig.11 ) to promote union 5) Secured with mesh (Fig. 12) which acts as a scaffold for the graft.
The immediate post-op (fig.13) was uneventful and Arm was immobilised in shoulder immobiliser strictly for two months

**Fig 13 Follow up : 2 months (Fig. 14)**
K wire was removed. Pendulum exercises were started. Support sling was given.

**Fig 14**
6 months (Fig. 15.1, 15.2)

**Fig 15.1**

**Fig 15.2**
1 year (Fig. 16.1, 16.2, 16.3, 16.4, 16.5)

**Fig 16.1**

**Fig 16.2**

**Results :**
- Joint function improved to a reasonable extent
- Being an non-vascularised graft, patient was advised non-weight loading mobilisation until full bony consolidation
- Good Functional improvement with the girl able to carry out daily routines, which she wasn't able to do earlier.
- Final limb length discrepancy was 2cm shortening compared to 6 cm shortening at presentation
- No graft rejection
- No infection
- No evidence of significant hypertrophy, stress fracture of graft occurred in this short follow up period

**Discussion :**
Options available to fill large bone defects are
1. Vascularized bone graft
2. Ilizarov technique
3. Prosthetic replacement
4. Non-Vascularized fibular graft
Ilizarov in upper limb is cumbersome and technically demanding. Considering the age of the patient, Prosthetic replacement was kept as a reserve for future. Vascularised fibular graft if highly technically demanding, reiring help of a plastic surgeon. So we proceeded with Non-vascularised fibular graft which is easy to harvest, technically easy and augmented with cancellous iliac crest grafts has shown good results. Maternal allograft was used because Valgus deformity and disabling ankle instability are quiet frequent in children after fibular resection (Paluska and Blount 1968; Witte 1972) but in adults it has been claimed that there is no significant disability if careful soft tissue dissection and distal fibular remnant of atleast 8 cm are maintained.
Conclusion:
Non-Vascularised Fibula graft and stabilisation is a useful technique for treatment of large bone defects. This technique can effectively bridge large defects, promote bone union, have acceptable complication rate and retain the quality of patients’ life (Functional improvement). Maternal allograft in children is always a good available option.