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Fibula bone grafting in infected gap non union: A prospective case series

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Abstract
Infected gap non union may be result of osteomyelitis or compound fractures. This is always a challenge for the surgeon. The incidence varies widely. Ilizarov's technique is one of the options available, which is a time taking, cumbersome procedure and needs an expert.
We performed fibula grafting as a 2 staged procedure. First is debridement with external fixation, followed by fibula grafting to bridge the gap.
Methods: 11 patients were enrolled in the study with infected gap nonunion. With average followed up of 14 months.
Procedure
i. First a through debridement and external fixator under appropriate antibiotic cover
ii. After infection is controlled fibula grafting to birch the gap fixed with cortical screws, external fixator is retained till the wound heels,
iii. Fixator is removed and cast immobilization for another 2 weeks
iv. Removal of cast, non-weight baring exercises for 2 weeks
v. Partial weight baring with crèches
Conclusion: Fibula bone grafting is a good option for infected gap nonunion. We achieved good results in 80% of the patients at our setup. This method is less time consuming and less demanding as compared to Ilizarov.

Keywords: Fibula bone, infected gap, Ilizarov's technique, immobilization

Introduction
Infected gap non union may result of osteomyelitis or compound fractures. This is always a challenge for the surgeon. The incident varies widely. In compound fracture type 3 b with bone loss is common cause, in that outcome depends on multiple fractures. And long standing of bone osteomyelitis specially in childrens, may lead to formation of sequestrum of the shaft of variable length. We included these cases as well in our study for staged fibular grafting.
Ilizarov one of the option available, which is a time taking needs a expert and patient has to bear with the heavy rings, and is not without complications.
This study is the prospective review of the 11 cases of infected gap nonunion managed by staged fibula grafting.

Materials and Methods

Table 1: 11 cases of infected gap non union were included in the study.

S. No	Diagnosis	Site	No. cases
1	Osteomyelitis with pathological fracture	Proximal humerus	2
2	Osteomyelitis with pathological fracture	Distal femur	2
3	Infected gap with implant	Radius	2
4	Compound fracture with bone loss (Gr III B)	Tibia	5

Methods
Stage I: Through debridement and external fixator under antibiotic cover (depending on culture and sensitivity). Intravenous Antibiotic and open dressing for average of 2 week (till infection is controlled and healthy granulation evident)

Stage II: Fibula sturt graft is given to bridge the gap and fixed with cortical screws or k wire, external fixator is retained, which gives stability, wound closed primarily or skin grafing or flap done to cover the wound, oral antibiotics for 2 weeks.

Stage III: Fixator removed and cast immobilization for 2 weeks Cast removed partial weight bearing with crutches for lower limb cases and guarded exercises for 4 weeks.
Follow up: patients followed up every month for a year. With average follow-up of 14 months.
Assessment of outcome at 6 month and at 1 year. In terms of

i. Union and incorporation of fibula determined clinically and radiologically
ii. Functional recovery compared with other limb
iii. Evidence of infection or other complication

Results
11 patients were included in the study. Follow-up monthly for an average of 14 months.
The radiological union achieved in 90% of the patients at average 5.1 months with incorporation of the fibula graft
80% of the patients have good functional recovery and satisfied with the treatment.

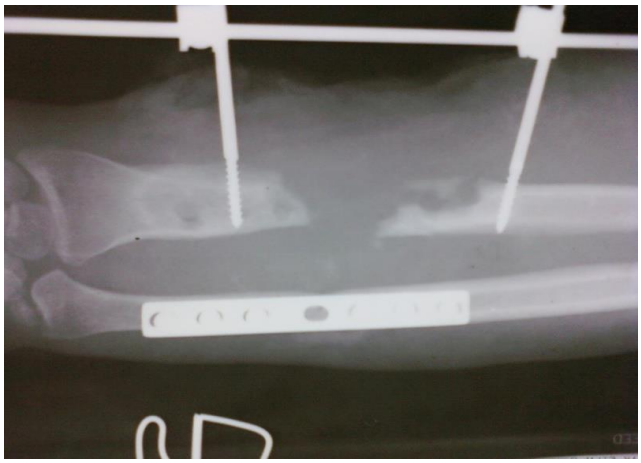
Complications
Shorting due to destruction of the growth plate by the disease process.

Morbidity at the donor site
Persistence of infection in 1 case with discharging sinus, managed with debridement and local antibiotics beeds with cement

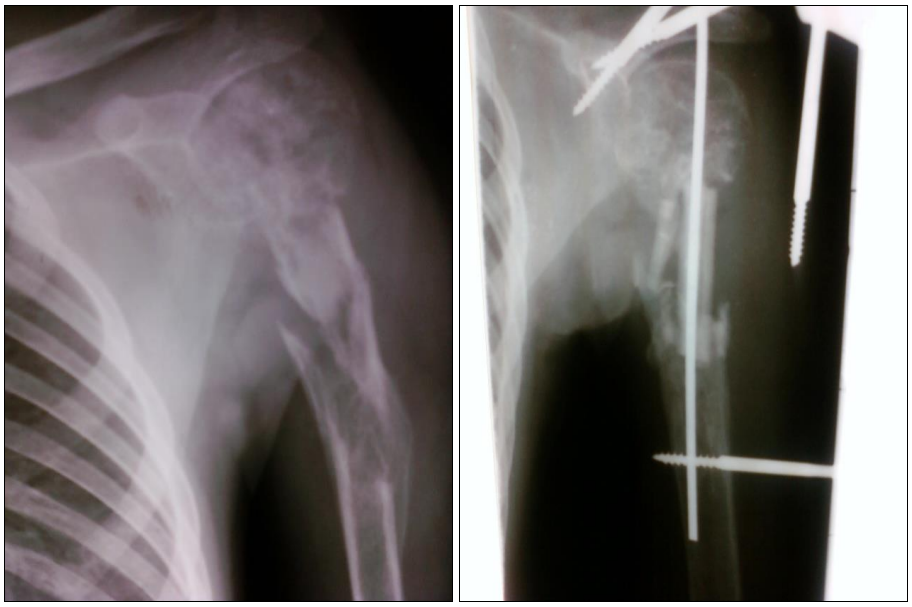
Discussion
Infected gap nonunion and osteomyelitis with pathological fracture is always a challenge for the orthopedic surgeon. Varity of options a available, each with its own limitations and complication.
Ilizarov one of the option available, which is a time taking needs a expert and patient has to bear with the heavy rings, and is not without complications.
Fibula is known as wonder bone. Fibula grafting both free and vacularised has being used in various studied with diverse results.

- Advantages of fibula graft, Fibula is the strongest autogenous bone graft available when compared to other cortical auto graft donor sites such as iliac crest and anterior tibial shaft.
- Large quantity (The entire proximal two thirds of the fibula >28 cm in length)
- The configuration of the proximal end of the fibula is an advantage.
- The proximal end has a rounded prominence that is partially covered by hyaline cartilage and forms a
- Satisfactory transplant to replace the distal third of the radius or the distal third of the fibula.

Our study is simplification of the complex problem and protocol for the management, which is time saving requires less expertise, easily reproducible specially in our Indian scenario and cost effective.

Case 1: Gap nonunion radius with implant.



Case 2: Chronic osteomyelitis of humerus.

Case 3: Osteomyelitis distal femur with pathological fracture.

Case 4: Compound fracture tibia with bone loss.

References

1. Al-Zahrani S, Harding MG, Kremli M, Khan FA, Ikram A, Takroni T. Free fibular graft still has a place in the treatment of bonedefects. Injury. 1993; 24:551-4.
2. Falder S, Sinclair JS, Rogers CA, Townsend PL. Longterm behavior of the free vascularised fibula following reconstruction of large bony defects. Br J Plast Surg. 2003; 56:571-584.
3. Madhat Mahdi, Ali Hafidh Bas. Free non-vascularized fibular graft in treatment of bone defects Basrah J Surg, March, 13, 2007. Yadav SS. Dual-fibular grafting for massive bone gaps in the lower extremity. J Bone Joint Surg [Am]. 1990; 72:486-94.
4. Wilson PD Jr. A clinical study of the biomechanical behavior of massive bone transplants used to reconstruct large bone defects. Clin Orthop Relat Res. 1972; 87:81-109.

5. Enneking WF, Eady JL, Burchardt H. Autogenous cortical bone grafts in the reconstruction of segmental skeletal defects. J Bone Joint Surg. 1980; 62-A:1039-1058.
6. Stevanovic M, Gutow AP, Sharpe F. The management of bone defects of the forearm after trauma. Hand Clin. 1999; 15:299-318.
7. Kim HS, Jahng JS, Han DY, Chun CH. Immediate ipsilateral fibular transfer in a large tiial defect using a ring fixator. Int Orthop. 1998; 22:321-4.
8. Hou SM, Liu TK. Reconstruction of skeletal defects in the femur with two strut free vascularized fibular grafts. J Trauma. 1992; 33:840-5.