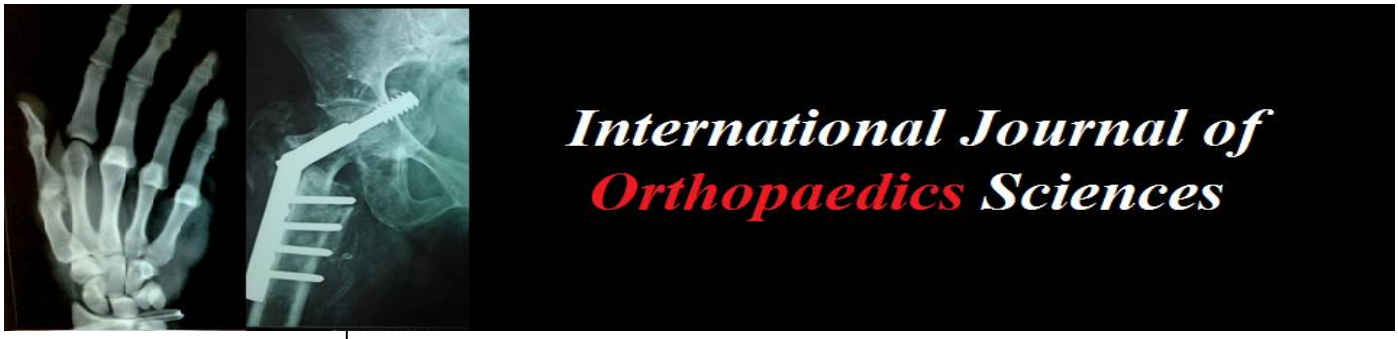

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Efficacy of modified Judet's technique in non union tibia, with inter locking nail as fixation device

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Abstract
Background- Non Union Tibia can be managed by many techniques, Judet's osteoperosteal flap is one of them. In traditional Judet's Technique compression plate was used as fixation device. We use interlocking nail as fixation device and studied the efficacy of its usage. Objective: To evaluate efficacy of modified Judet's technique.
Methodology: A total 20 Patients of Victoria Hospital and Bowring & Lady Curzon hospital Bangalore during the period from 2017 to 2019 with aseptic non-union tibial fractures are taken for study. All cases were treated with opening of fracture site, freshening of fracture edges and raising of osteoperosteal flap followed by internal fixation with interlocking nail. The cases were followed for post operatively at 4 weeks, 12 weeks and 24 weeks.
Result: Excellent results were obtained in 80% of cases. Good results were obtained in 15%, fair results in 5%. Complications include 10% delayed wound healing, 10% restriction of ankle and knee movements.
Conclusion: Our study suggests that Judet's osteoperiosteal decortication (Shingling) with interlocking nail as internal fixation device is an effective technique in the surgical management of aseptic non-union tibia. It is also cost effective and alternative to other bone healing augmentation procedures. The procedure is simple and easily reproducible in most hospital settings, even in peripheral centres.

Keywords: Aseptic non-union, Judet's osteoperiostel flap, decortication, shingling.

1. Introduction
Non-union presents a significant problem to the orthopaedic surgeons, requiring complex procedures with doubtful outcome. It also is a burden on the patient economically, functionally and psychologically.
A number of techniques have been described for treatment of non union. These include internal and external fixation, bone grafting, bone transport with distraction osteosynthesis, decortication techniques, shock wave therapy, use of bone morphogenetic proteins and platelet rich plasma. [1] The basic principle of treatment of non union involves open reduction with bone grafting and stable internal fixation. Local bone graft provide osteoconductive, osteinductive and osteogenic factors that augment the bone healing. In contrast, Robert Judet first described his method of osteoperiosteal decortication and stated that faster and firmer healing of pseudoarthrosis could be achieved. [2] This technique does not require any external aid for the fracture union avoiding donor site morbidity. The method describes using a sharp, heavy chisel to elevate cortical chips, maintaining their periosteal attachment and hence blood supply. In the original work Judet used compression plating and external fixation device as stabilisation technique. In our study we raised similar osteoperosteal flap but used interlocking Nail as fixation device. Twenty cases were selected and the outcome studied.

2. Materials and methods
20 cases with Aseptic non-union tibial diaphyseal fractures who are surgically fit were included after obtaining informed and written consent. Ethical committee approval was taken before starting the study. It was a prospective study during the period of November 2017 to September 2019 treated surgically for aseptic non-union of tibial fractures by using judets osteoperiosteal flap method. Septic Non-union and gap non-union cases were excluded. Among 20 cases, 9 cases were earlier treated with external fixation, 7 cases were earlier

treated with interlocking nail and 4 cases were earlier conservatively treated by osteopath.

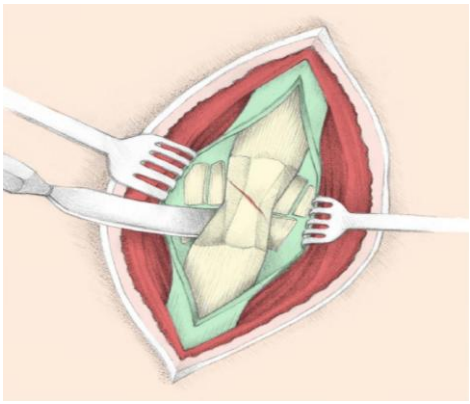

Fig 1: Fracture site exposed by chisel leaving bone flakes attached to periosteum, Courtesy- Guyver *et al*.

2.2. Surgical technique: Under sterile conditions patient is placed in supine position over a radiolucent operating table. The operating leg is positioned freely, with knee flexed 90 over the edge of the operating table to relax the gastro soleus muscle and allow traction by gravity. The non operating leg is placed in abduction, flexion and external rotation to ensure free movements of the image intensifier from A.P. to lateral plane. The table is adjusted to a comfortable operating height. The affected limb is thoroughly scrubbed from mid-thigh to foot with Betadine scrub. Then limb is painted with beta dine solution from mid thigh to foot. Rest of the body and other limb is properly draped with sterile drapes. Sterile gloves are applied to the foot and sterile-drape over the leg from knee joint to ankle. Shingling: An incision is made down to the bone, through the periosteum. By using chisel of size 10mm and 25mm, bone Chips of 1-3mm diameter thick are elevated for 5-10cm proximal and distal to fracture site and for 60-75% of the bones circumference. The underlying bone can then be debrided or osteotomised as necessary before internal fixation with Interlocking nail tibia and suturing of soft tissue envelope was done to ensure that the bone graft is approximated over the fracture site. Sterile dressings applied over the wound Compression bandage given .Capillary filling and peripheral arterial pulsations checked.

3. Result

The end results of all 20 cases are summarized here. All the cases had a follow up of 12 months. Results were evaluated at 6th week, 3rd month, 6th month, 9th month and 1 year. Majority of Patients are aged between 51 to 60 years. The youngest patient was 21 years, oldest patient was 60 years. And the mean age was 45.8 years. Majority of the patients are males 14 (80%) and the remaining 6 are females (20%). In our study 11 fractures were open type (55%) and remaining 9 were closed type (45%). Most of the cases are distal one third fractures (50%). Next common level of fracture in tibia in our study is middle third (35%) and proximal one third is 15%. Among cases which included in our study 45% had external fixation as initial method of stabilisation, 35% had ILN treatment and 20% had history of osteopath treatment.

In our study the average range of time from initial management to decortication varied from 9 months to 12 months with mean of 10 months. In our series all 20 patients were united at the end of 20 weeks.

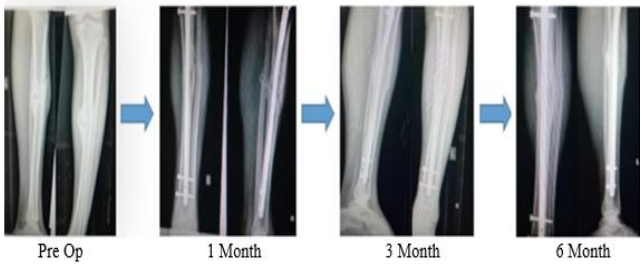

Fig 2: Study the average range

In our study time taken to unite after decortication varied from 4.2 months to 6 months with mean of 5.2 months. In our case series joint stiffness was observed in 3 patients (15%), delayed wound healing in 2 patients (10%) and no complications in remaining 15 patients.

Detailed analysis of function of the patient was done on the basis of following criteria by Kleman and Borner.

In our study 85% of patients had excellent results, 10% of patients have good results and 5% of patients have fair results.

4. Discussion

Treatment of non union of tibia evolved since many years. There are several methods of treatments and there are many modifications in each treatment method. Judet's original method consists of elevating cortical chips by special chisel, the chips remaining attached to the periosteum and to the muscular tissue surrounding the non union site. [2] This method is easy to use. The segment which is to be decorticated is approached directly, incision goes right through the muscular tissue and the periosteum down to the bone. 1 chips are to be 1mm thick. The principle of this technique is faster healing of the non-union when surrounded by bone chips from the un\united bone itself, provided the bone chips are not de-vascularized. The technique is also reported to be easier in cases of non-union where adhesions have formed between the soft tissue with compression plating to treat long bone non-union (both upper and lower limb long bone fractures) and concluded that routine use of bone grafts is not necessary when there is minimal or no bone loss for treatment of non-union.

Ramoutar *et al.* [3] combined Judet's technique with compression plating to treat long bone non-union(both upper and lower limb long bone fractures) and concluded that routine use of bone grafts is not necessary when there is minimal or no bone loss for treatment of non-union.

Guyver *et al.* [4] observed that Judet's technique with plate and screw fixation was highly effective in treating failed fracture union and was best suited for hypertrophic non-union in short oblique and transverse diaphyseal fractures which failed to unite following intramedullary nailing.

In our study was mean age of patients was 45.8. In similar study by Bijukache years the mean was 42 years. In study by P. Guyver *et al* the mean age was 38 years. In our study of 20 patients about 80% were males and 20% were females this in comparison with study by Guyver *et al* which had 70% as male and 30% female subjects in their study. In our study about 70% of fractures were open type and rest 30% were closed in nature. In study by Bijukache *et al*. 91.4% of the study subjects had open type of injury and only 8.6% had closed injury.

The cases included in our study are external patients who had past history of treatment with fixator, interlocking nail and

those with osteopath treatment. About 45% had external fixation as initial method of stabilisation, 35% had ILN treatment and 20% had history of osteopath treatment. In study by Bijukache *et al*. 72% of patients had external fixator method 14% of patients had ILN and 12% had conservative as modality of treatment. In our study atrophic non union accounted for 70% and hypertrophic non union for 30%. In study by P. Guyver *et al* Atrophic non union accounted for 60% of cases and 40% of cases were hypertrophic type.

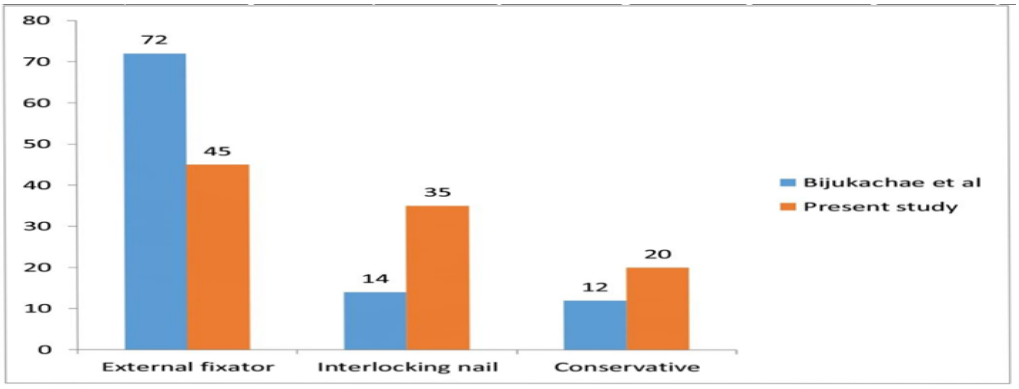

Fig 3: Initial treatments

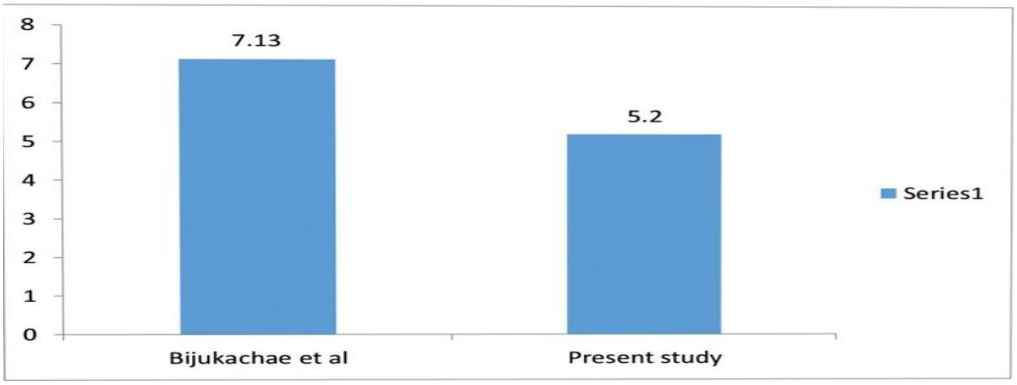

Fig 4: Union Time Comparison

In our study time to union after decortication with average varied from 4.2 months to 6 months of 5.2 months. In study conducted by Bijukache *et al*. union time varied from 6 to 15 [months with the mean time to union after decortication was 7.13 months.

Table 1: Comparison of results of different similar decortication studies

Authors	Total no of case	No. of Tibial Non Unions	No. of Atrophic Tibial non-union	Union Rate	Average time for union(Months)
Judet *et al*.	849	416	Not mentioned	94.83%	4 - 8
Ramoutar *et al*.	96	17	Not mentioned	100%	6.4
Guyver *et al*.	40	10	Both Hypertrophic and atrophic	90% (for non-union tibia individually)	8
Our study	20	20	Both atrophic and hypertrophic		5.2

5. Conclusion

Our study suggests that Judet's method of osteoperiostel flap (Shingling technique) combined with internal fixation is a safe and effective technique in the surgical management of non-union tibial shaft fractures. Autologous bone graft used in the treatment of non-union tibial shaft fractures causes donor site morbidities which can be avoided by Judets procedure. This decortication technique is also cost effective and alternative to other bone healing augmentation procedures like BMP, EMF stimulation, extracorporeal of shockwave therapy, etc., especially in poor, developing countries. This procedure is simple and can be easily reproducible in most of the hospital settings.

6. References

1. Lenza LM, Ferraz SDB, Viola DCM *et al*. Platelet rich plasma for long bone healing. Einstein. 2013; 11:122-7.
2. Judet PR, Patel A. Muscle pedicle bone grafting of long bones by osteoperiosteal decortication. Clinical Orthopaedics and Related Research. 1972; 87:74-80.
3. Ramoutar DN, Rodrigues J, Quah C, Boulton C, Moran CG. Judet decortications and compression plate fixation of long bone non-union. 2011; 03:045.
4. Paul guyver, Christopher Wakeling, kumar Naik. Judet osteoperiosteal decortication for treatment of non-union. The cornwall experience, injury, 2012, 1187-1192.