



Orthopaedics

ROLE OF ANTIBIOTIC COATED INTRAMEDULLARY RUSHNAIL IN MANAGEMENT OF GRADE IIIB COMPOUND FRACTURES OF TIBIA

Dr. Satish Parupalli

Associate Professor, GMC, Sangareddy.

Dr. K. Vinoothna

Asst.Prof, GMC, Sangareddy.

Dr. N Sai Veena

Asst.Prof, GMC, Sangareddy.

Dr. Kiram Kumar Joshi*

Asst.Prof, GMC, Sangareddy. *Corresponding Author

KEYWORDS :

INTRODUCTION:

Antibiotic coated intramedullary rush nail is one of the options available for early management of grade IIIB compound fractures tibia. It also has an extra advantage of early control of infection and gives access to soft tissue management with good rate of union.

METHODS AND MATERIALS:

We prospectively studied 20 newly admitted cases of grade IIIB compound diaphyseal fractures of tibia admitted in Government general hospital, Sangareddy, Department of orthopedics, GMC, Sangareddy between 2022-2025 managed with antibiotic coated intramedullary rush nail. All patients were between age 15-50yrs, out of them 13 were male and 7 female and soft tissue management was done either by primary closure/SSG/flap and followed up for 6-14 weeks for checking bone union and wound healing.

Compound Fracture:

An open fracture is defined as an injury where the fracture and the fracture hematoma communicate with the external environment through a traumatic defect in the surrounding soft tissues and overlying skin. Open fractures are often high-energy injuries and are frequently associated with life-threatening polytrauma. The principles of treatment of open injuries have gradually evolved over the centuries and many advances have come. The most common compound fracture seen in long bone is tibia. Functional restoration is aided by aggressive wound debridement, early definitive fracture stabilization and early wound closure or cover to achieve bone and soft tissue healing as soon as possible.

FUNCTIONAL OUTCOME

*PATIENT FACTORS *INJURY FACTORS *COMORBID FACTORS GUSTILLO AND ANDERSON'S CLASSIFICATION:

Type	WOUND	LEVEL OF CONTAMINATION	SOFT TISSUE INJURY	BONE INJURY
I	<1 CM LONG	CLEAN	MINIMAL	SIMPLE, MINIMAL COMMINUTION
II	>1CM LONG	MODERATE	MODERATE, SOME MUSCLE DAMAGE	MODERATE COMMINUTION
IIIA	USUALLY >10 CM	HIGH	SEVERE WITH CRUSHING	USUALLY COMMINUTED, SOFT TISSUE COVERAGE POSSIBLE

IIIB	USUALLY > 10 CM	HIGH	VERY SEVERE LOSS OF COVER	BONE COVER POOR, REQUIRES SOFT TISSUE RECONSTRUCTIVE SURGERY
IIIC	USUALLY >10CM	HIGH	VERY SEVERE LOSS OF COVER AND VASCULAR INJURY REQUIRING REPAIR	BONE COVER POOR, USUALLY REQUIRE SOFT TISSUE RECONSTRUCTIVE SURGERY

SKELETAL STABILISATION:

Stable skeletal stabilization must be achieved as it helps to alleviate pain and prevent further soft tissue damage. during skeletal stabilization the length of the limb must be restored as this restores the correct tension to the soft tissues and this decrease swelling, improves circulation, and aids venous and lymphatic return. it also increases the comfort of the patient during wound inspection and facilitates early rehabilitation and movement of joints.

PRIMARY INTERNAL FIXATION:

Intramedullary nails are often the first choice for fixation of lower limb diaphyseal fractures as they provide superior biomechanical conditions and also maintain the length and rotation of the limb. these are ideally suited for injuries where contamination is minimal and effective debridement has been performed.

TREATMENT PROTOCOL FOLLOWED USUALLY FOR COMPOUND TIBIA FRACTURES:

GRADE I - DEFINITIVE FIXATION BY INTERLOCKING
 GRADE II - NAIL TIBIA
 IIIA - EXTERNAL FIXATOR/INTERLOCKING NAIL
 GRADE III - IIIB - ??? EXTENAL FIXATOR/ANTIBIOTIC RUSHNAIL

PROCEDURE FOR PREPARATION OF INTRAMEDULLARY ANTIBIOTIC RUSHNAIL:

Instruments required are 32 FR chest tube, Gentamycin bone cement, 2.5mm rush nails of length 30-38, general orthopedic surgical instruments

STEPS:

Desired length of rush nail is selected and the tapered end of rush nail is

curved like hook of other end.³² FR chest tube is taken and slit vertically to fill the bone cement, the gentamycin containing PMMA powder is mixed with monomer (Methylmethacrylate) in a bowl until working phase of cement is achieved, the rush nail selected is then inserted into the slit chest tube and the bone cement is packed in the chest tube. the extra cement is removed and the proximal end of rush nail is left over which is to be used while extraction of nail. once the cement is completely polymerised and has set the slit over chest tube is removed. the antibiotic rush nail is inserted by routine IM nailing technique in the unreamed medullary canal. postop the patient is immobilised and non-weight bearing is advised for 6-10 weeks.

CLINICAL IMAGES AND INVESTIGATIONS:
30Y, M AFTER HIGH VELOCITY TRAUMA SUSTAINED
GR IIIB COM FRACTURE BB RIGHT LEG @D/3RD, WOUND PHOTO AND XRAY AT THE TIME OF PRESENTATION



WOUND PHOTO AND POST OPERATIVE XRAY ON POD 5



**DEFINITIVE NAILING DONE
AT 12 WEEKS AFTER COMPLETE
WOUND HEALING**

6MONTHS POSTOP



RESULTS:

20 patients who sustained gr IIIB compound fractures were followed up for a period of 10-14 weeks post admission and procedure. out of which 13 patients showed proper control of infection with good wound healing with primary suturing and remaining 7 patients required additional plastic surgery procedures like SSG/FLAP. These patients were followed every 4 weeks with ESR, CRP, CBP and X-RAY and definitive IM nailing was done once infection was controlled.

CONCLUSION:

Antibiotic coated IM nail is one of the better options available for early management of grade IIIB compound diaphyseal fractures. It provides a high concentration of antibiotics locally, fills dead space gives good mechanical stability at fracture site and promotes bone healing. Also gives easy access for other procedures like SSG/FLAP and regular dressings.

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