



INDICATIONS, BELIEFS AND POST OPERATIVE OUTCOME RELATED TO IMPLANT REMOVAL IN ORTHOPAEDICS

Dr. Girish B Mote	Assistant professor, department of Orthopaedics MGIMS Sevagram.
Dr. Rohan R Patil	Consultant orthopaedic surgeon, Department of Orthopaedics MGIMS Sevagram
Dr. Sridhar M Reddy	Assistant professor, Department of Orthopaedics MGIMS Sevagram.
Dr. Supratim S Roy*	Assistant professor, Department of Orthopaedics MGIMS Sevagram. *Corresponding Author

ABSTRACT

INTRODUCTION: Orthopaedics has moved at a brisk pace in recent time. The goal has been shifted to stable functional fixation. Most patients relate complaints and symptoms like pain, swelling and stiffness after their fracture has healed to the presence of the metal implant. This study was conducted to find out the reasons for implant removal in the conditions where there is dilemma for the same.

MATERIALS AND METHODS: patients admitted from 1st January 2016 to 31st December 2016 in department of Orthopaedics for implant removal were studied for various factors.

STATISTICAL ANALYSIS USED: Data analysed using Epi Info software.

RESULTS: Out of 94 patients 65 (69.1%) were males and 29(30.8%) were females. Mean age was 29.6 (\pm 16.3) years. 59 (63%) of the patients had lower limb implant and 35 (37%) had upper limb implant. Mean duration for implant removal was 32 Months (\pm 4.4). The indications for Implant removal found to be pain 50 (53.1%), Infection 17 (18.1%), Bursitis 8 (8.5%) followed by Mechanical Obstruction 2(2.3%). Most common site for implant removal found to be united shaft femur fracture 14 (14.9%), Shaft Tibia fracture 10(10.6%), Both Bone forearm Fracture 10 (10.6%), Neck of Femur and Proximal Tibia each account for 7 (7.4%). Patella fractures 5 (5.3%) followed by Bimalleolar Fracture 4(4.3%).

CONCLUSIONS: Implant removal shares a significant amount of surgeries and those surgeries lack proper guidelines. Pain was the prime indication of implant removal. With advent of newer hardware, use of titanium alloys structured guidelines for implant removal is needed.

KEYWORDS : Implant removal, metal, hardware, fracture, infection.

INTRODUCTION:

Orthopaedics has moved at a brisk pace in recent time. With the aid of modern advancement even most complex trauma can be managed. The goal has been shifted from anatomical fixation to stable functional fixation. Use of orthopedic Implant has also been changed from time to time. Most patients relate complaints and symptoms like pain, swelling and stiffness after their fracture has healed to the presence of the metal implant.⁽¹⁾

The Arbeitsgemeinschaft für Osteosynthesefragen (AO), founded in 1958, advised removing all materials as a standard, especially in the lower extremity.⁽²⁾ There is an ongoing debate concerning the justification of elective surgical implant removal.^(3,4) Certainly, the indication for hardware removal is unquestioned in patients with surgical site infection, metal allergy, soft tissue compromise or failure of the osteosynthesis.⁽⁵⁾

Hence Present study was planned to identify indications, patient's belief regarding presence of implant in the body and post operative outcome after successful elective implant removal.

Subjects And Methods:

Present study was conducted on the patients admitted for implant removal in the orthopaedics ward of our hospital. Patients admitted over a period of 12 month starting from 1st January 2016 to 31st December 2016 were included in the study. Data retrieved from the Hospital Information System (HIS). Patients who had fixation devices intended to be removed after a definite interval to begin with, like Percutaneous K-wires, external fixators and tarsal screws, were not included in the study. Patients requiring removal of joint prostheses were

also excluded from the study.

Routinely at the time of admission, the potential risks of the operation and the possibility of non-favourable outcomes were explained to all patients. After admission, routine inpatient investigations were performed on all patients to evaluate their fitness for surgery.

Implant removal was then done in the next OT list. All patients received prophylactic antibiotics and tourniquet was used wherever possible. Postoperatively, the patients were retained in the hospital for variable periods depending on the indication of removal and the condition of the wound. Antibiotics were continued for longer duration in patients with infected hardware. At discharge, all the patients were strictly advised to protect the extremity for a variable length of time as demanded by the bone and the implant removed. They were followed in the OPD on monthly basis up to 3 months and evaluated for symptom relief/persistence/new problems, and the data were collected. Visual analogue scale was used to assess pain at follow up period. Patients were also telephonically contacted and data was gathered.

Data collected in structured questionnaire and filled in Epi Info software. Primarily data was analyzed to see for completeness by computing frequencies. To compare mean student t-test was applied.

RESULTS:

Total 94 patients were included in the study after fulfilling inclusion criteria. These patients were followed after elective implant removal and telephonically contacted whenever required. 65 (69.1%) were males and 29(30.8%) were females. Mean age was 29.6 (\pm 16.3) years. 59 (63%) of the patients had

lower limb implant and 35 (37%) had upper limb implant. Mean duration for implant removal was 32 Months (\pm 4.4) as shown in Table 1.

Table 1. Demographic Parameters And Characteristics Of Study Population.

Parameters		Number(percent)/Mean \pm SD
Mean Age		29.6 (\pm 16.3) years
Sex	Male	29(30.8%)
	Female	65(69.1)
Side Involvement	Rt	56 (59.5%)
	Lt	36(38.3%)
	Bilateral	02(2.1%)
Site Involvement	Upper Limb	35 (37.6%)
	Lower Limb	59(62.4%)
Mean Duration		32 (\pm 4.4) months

The indications for Implant removal found to be pain 50 (53.1%), Infection 17 (18.1%), Bursitis 8 (8.5%) followed by Mechanical Obstruction 2(2.3%) as shown in Table 2.

Table 2: Indications For Implant Removal

Indication For Implant Removal	Frequency(n)
Pain	50(53.1%)
Infection	17(18.1%)
Bursitis	8(8.5%)
Mechanical Obstruction	2(2.3%)
AVN/Arthritis	3(3.2%)
No Complaint	14(14.9%)

There were 3 cases that developed avascular necrosis of femur following fixation with CC screw for Neck Femur fracture.

Most common site for implant removal found to be united shaft femur fracture 14 (14.9%), Shaft Tibia fracture 10(10.6%), Both Bone forearm Fracture 10 (10.6%), Neck of Femur and Proximal Tibia each account for 7 (7.4%). Patella fractures 5 (5.3%) followed by Bimalleolar Fracture 4(4.3%). The distribution in terms of side and site is as shown in Table 3. Most common implant removed was TENS nail 13 (13.9%), CC screw 12(12.8%) Tibia IM Nail 11 (11.7%), Tension Band Wiring 9 (9.5%) and Femoral IM Nail 8(8.5%).

Amongst 17 (18.1%) who developed infection after fracture fixation, most commonly affected site is proximal tibia, 4 (23%) cases. Proximal Tibia locking plate 4 (23%) found to be most commonly removed implant in those infected cases. Staph aureus found to be most common organism to be associated with infection. These patients were treated with intravenous antibiotics for 2 week according to the culture sensitivity of organism. 16 (95%) of the patients got relieved of infection after successful elective implant removal.

In the follow up 48 (96%) patients got relieved of pain whereas 2 Patients were still complained of pain. 14 (15%) patients were asymptomatic which insisted implant removal. Most common belief associated with implant was it can cause poison in the body, decreased body strength and implant may get corroded, leads to an allergy and can cause cancer in the body.

DISCUSSION:

Present study planned in view of understanding indications of implant removal in rural area. Also to identify beliefs associated with metal implant in the body. We also analyzed the clinical, radiological and functional outcome after successful implant removal.

In our study we identified pain 50 (53%) as the prime indication for implant removal. Hasseb et al^[6] also identified pain and discomfort 39.7 % as most common complaint

responsible for implant removal. Whereas Reith et al documented doctors' recommendation 68% as the prime indication for implant removal followed by the pain 31%.^[7]

Present study shown infection as the second next indication for implant removal accounting for 17 (18.1%). Hasseb et al while identifying indications for implant removal documented 29% of patients developing infection associated with implant. John William Costerton well documented role of biofilm in the development of infection. More than 65% of the infections are related to biofilm.^[8] In our study we identified staph aureus 5(29%) most commonly isolated micro-organism followed by Klebsillas sp and Acinetobacter Baumenii. Consistent findings were obtained by Trampus et al showing Staphylococcus as main contributor for implant related infection.^[9]

Present study also shown, after successful removal of implants 95% patients relieved of symptoms like pain, mechanical obstruction which was compared with Visual Analogue score in follow up period. Similarly 16 (94%) patients got relief of infection but one patient continued to have pus discharge even after successful implant removal. Minkowitz et al. prospectively studied 60 patients who had implant removal for hardware pain, and at 1 year follow-up all their patients were satisfied.^[10]

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