Paediatric Osteomyelitis treated with antibiotic coated biosynthetic beads(stimulan).

Dr Shreyas Kappalguddi

Resident (II)

Dept of Orthopaedics

A Case Of Osteomyelitis of Distal Third of Right Radius

Introduction

- A 15 year old male came with complaints of pain and swelling in right forearm since 45 days.
- No h/o fall or trauma
- O/E-

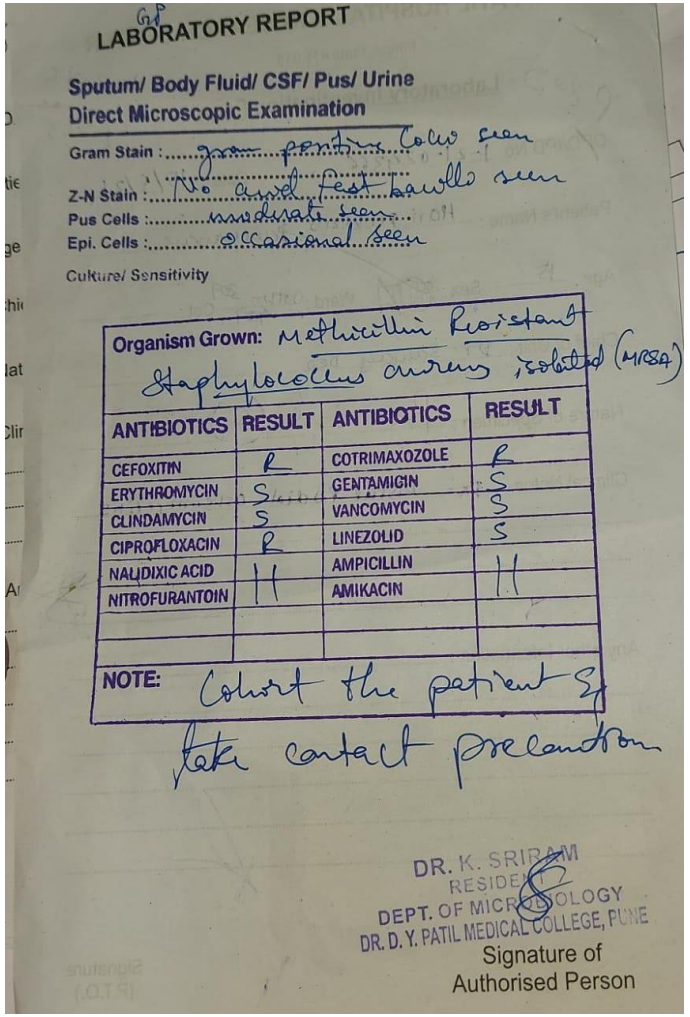
Right forearm:

- Tenderness, Swelling, Local rise of temperature- Present
- Range of motion: restricted & painful at wrist joint.

Clinical Images- at the time of admission

Blood Investigation- Infective markers

- Erythrocyte sediment rate -79
- Total leucocyte count-10500
- Q c-reactive protein -9.93
- Culture report of pus from the wound site showed Methicilline resistant Staphylococcal Aureus infection(MRSA).



LABORATORY REPORT

Sputum/ Body Fluid/ CSF/ Pus/ Urine

Direct Microscopic Examination

Gram Stain : Gram positive Cocci seen

Z-N Stain : No acid fast bacilli seen

Pus Cells : moderate seen

Epi. Cells : occasional seen

Culture/ Sensitivity

Organism Grown: Methicillin Resistant Staphylococcus aureus isolated (MRSA)

ANTIBIOTICS	RESULT	ANTIBIOTICS	RESULT
CEFOXITIN	R	COTRIMAXOZOLE	R
ERYTHROMYCIN	S	GENTAMICIN	S
CLINDAMYCIN	S	VANCOMYCIN	S
CIPROFLOXACIN	R	LINEZOLID	S
NALIDIXIC ACID	H	AMPICILLIN	H
NITROFURANTOIN		AMIKACIN	

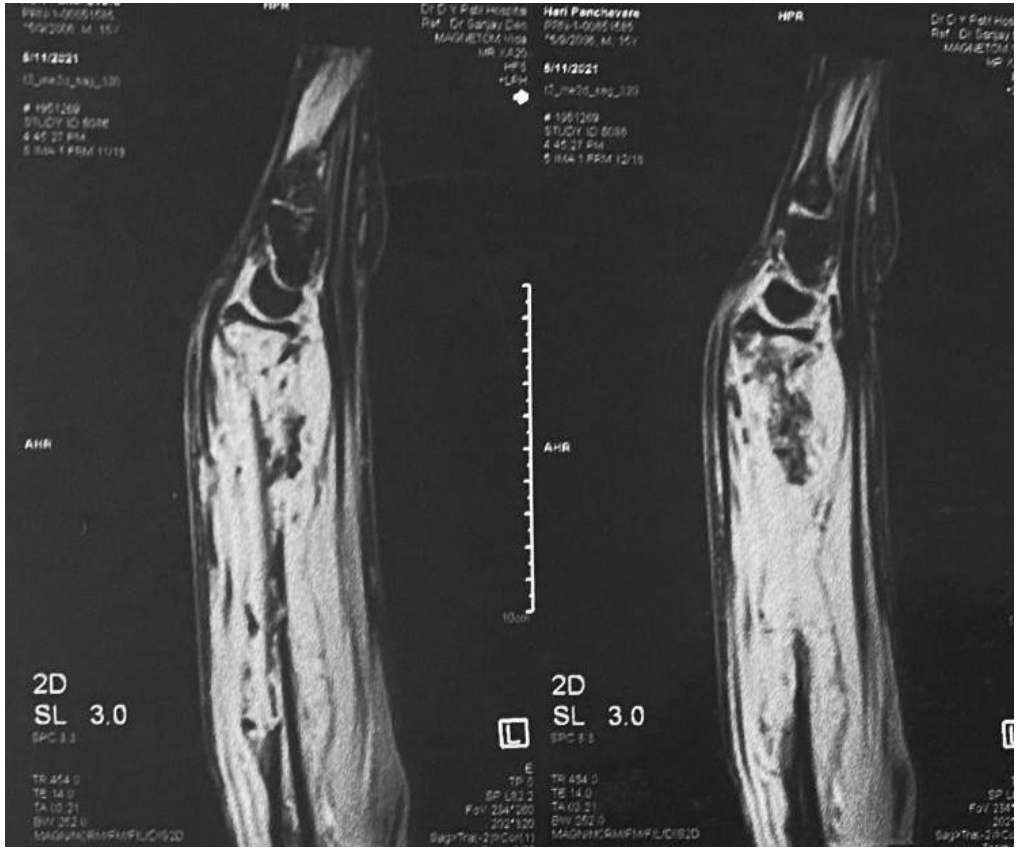
NOTE: Cohort the patient & take contact precautions

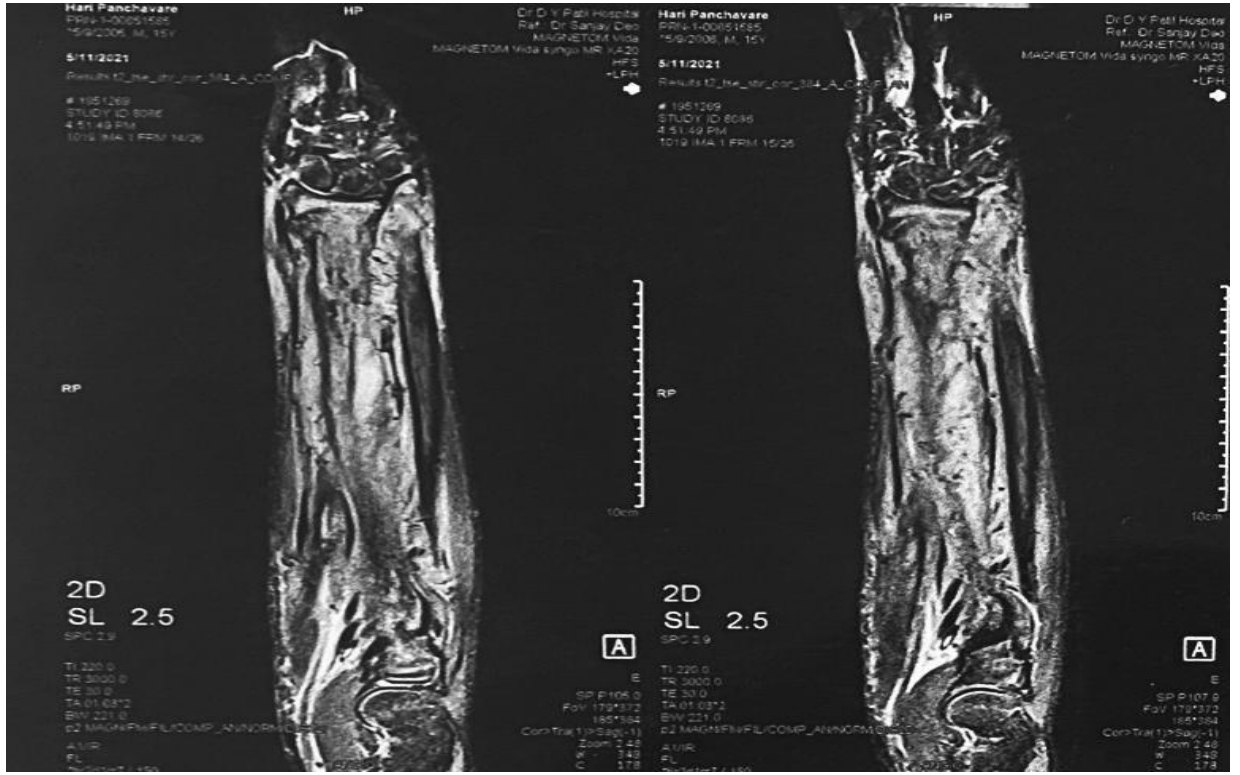
DR. K. SRIRAM
RESIDENT
DEPT. OF MICROBIOLOGY
DR. D. Y. PATIL MEDICAL COLLEGE, PUNE
Signature of
Authorised Person

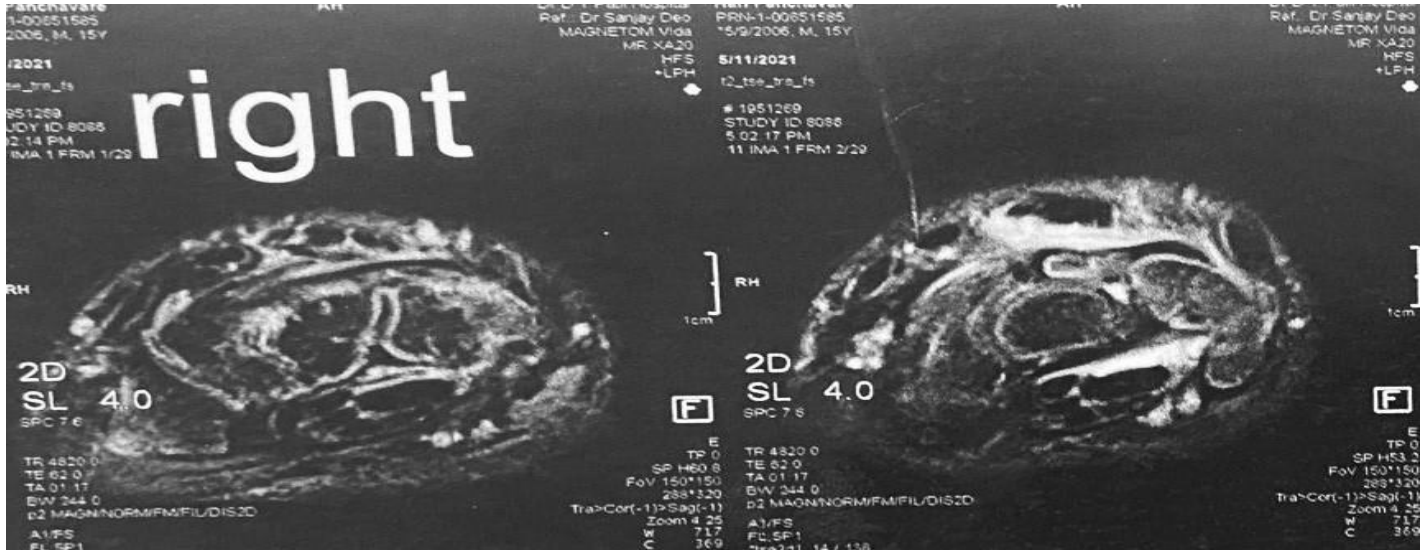
X-Ray

- Periosteal reaction with thickening
- Focal osteolysis
- Endosteal scalloping
- Loss of trabecular bone architecture

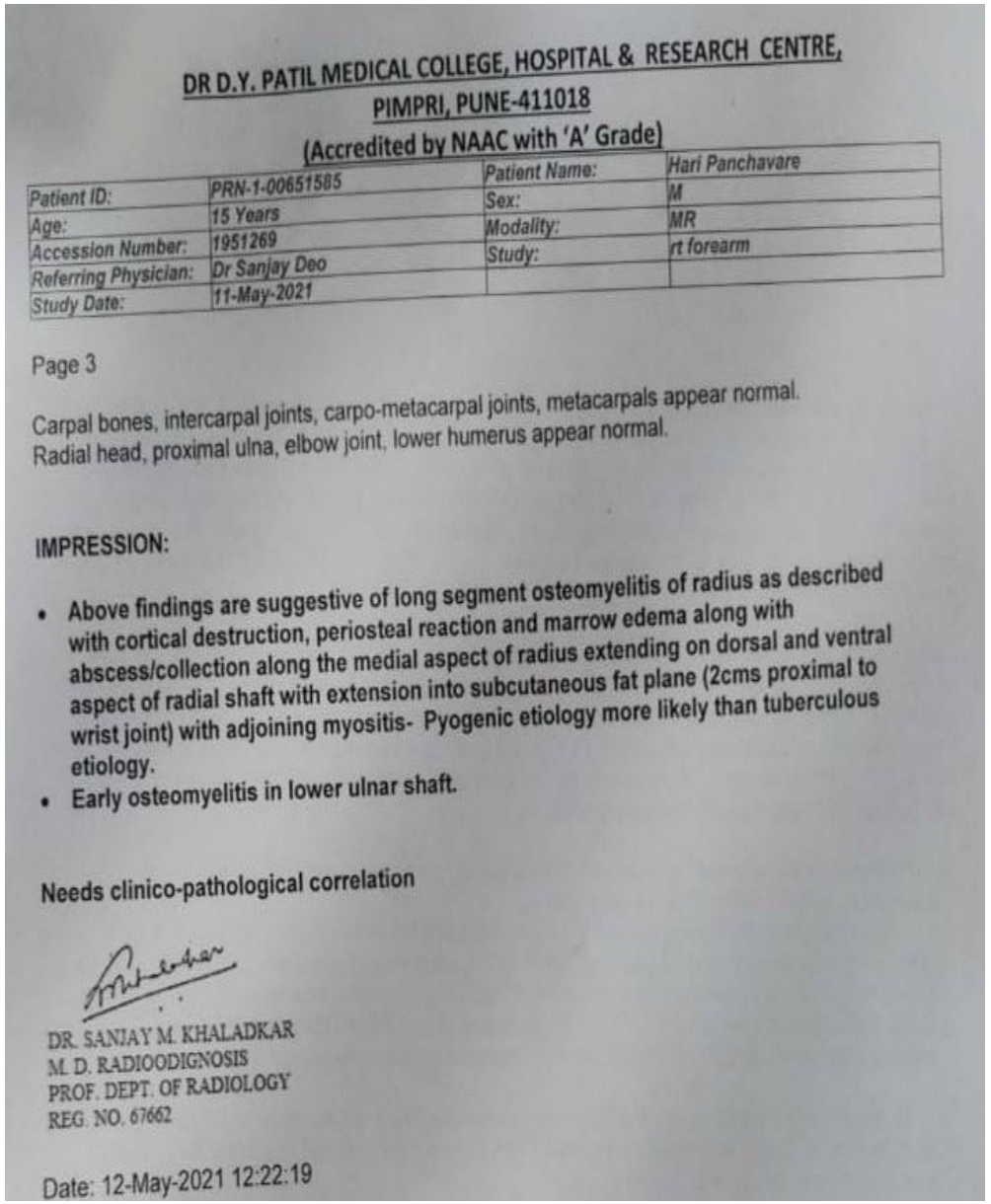
MRI







MRI REPORT- S/O Acute Pyogenic Osteomyelitis.



DR D.Y. PATIL MEDICAL COLLEGE, HOSPITAL & RESEARCH CENTRE,
PIMPRI, PUNE-411018
(Accredited by NAAC with 'A' Grade)

Patient ID:	PRN-1-00651585	Patient Name:	Hari Panchavare
Age:	15 Years	Sex:	M
Accession Number:	1951269	Modality:	MR
Referring Physician:	Dr Sanjay Deo	Study:	rt forearm
Study Date:	11-May-2021		

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Carpal bones, intercarpal joints, carpo-metacarpal joints, metacarpals appear normal.
Radial head, proximal ulna, elbow joint, lower humerus appear normal.

IMPRESSION:

- **Above findings are suggestive of long segment osteomyelitis of radius as described with cortical destruction, periosteal reaction and marrow edema along with abscess/collection along the medial aspect of radius extending on dorsal and ventral aspect of radial shaft with extension into subcutaneous fat plane (2cms proximal to wrist joint) with adjoining myositis- Pyogenic etiology more likely than tuberculous etiology.**
- **Early osteomyelitis in lower ulnar shaft.**

Needs clinico-pathological correlation

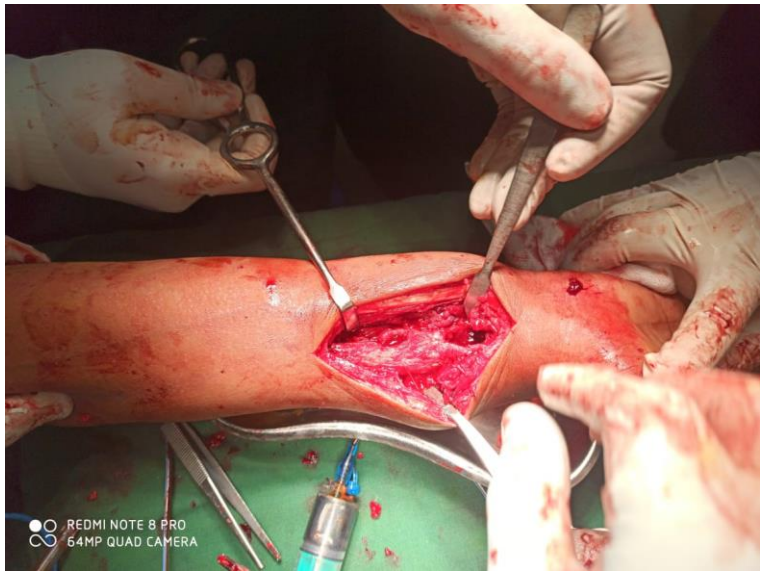
DR. SANJAY M. KHALADKAR
M. D. RADIOODIGNOSIS
PROF. DEPT. OF RADIOLOGY
REG. NO. 67662

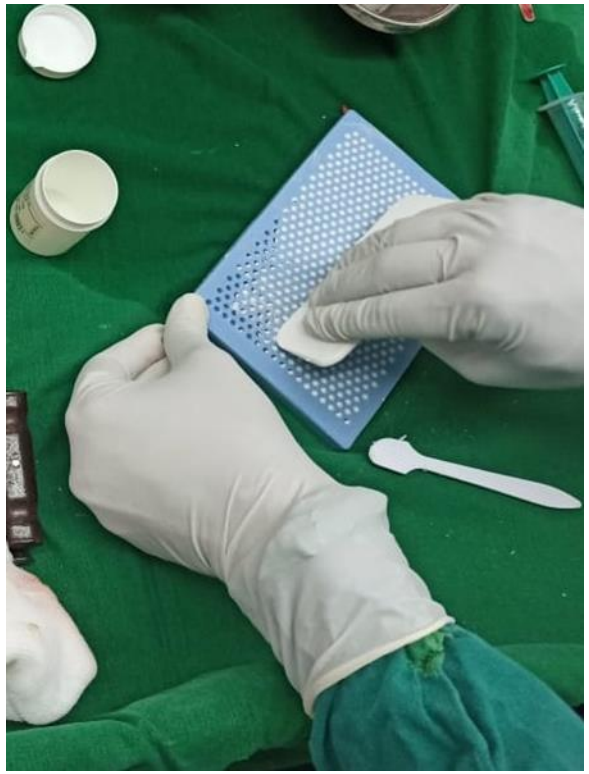
Date: 12-May-2021 12:22:19

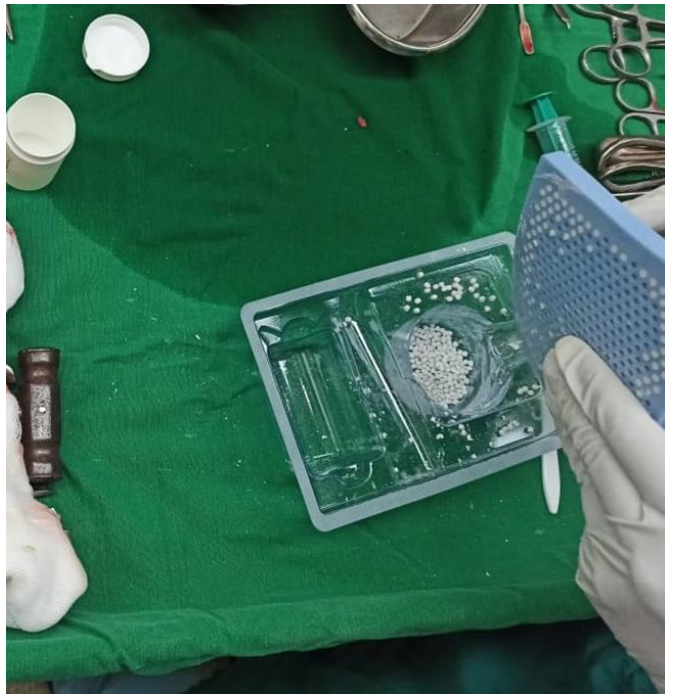
Surgical Management

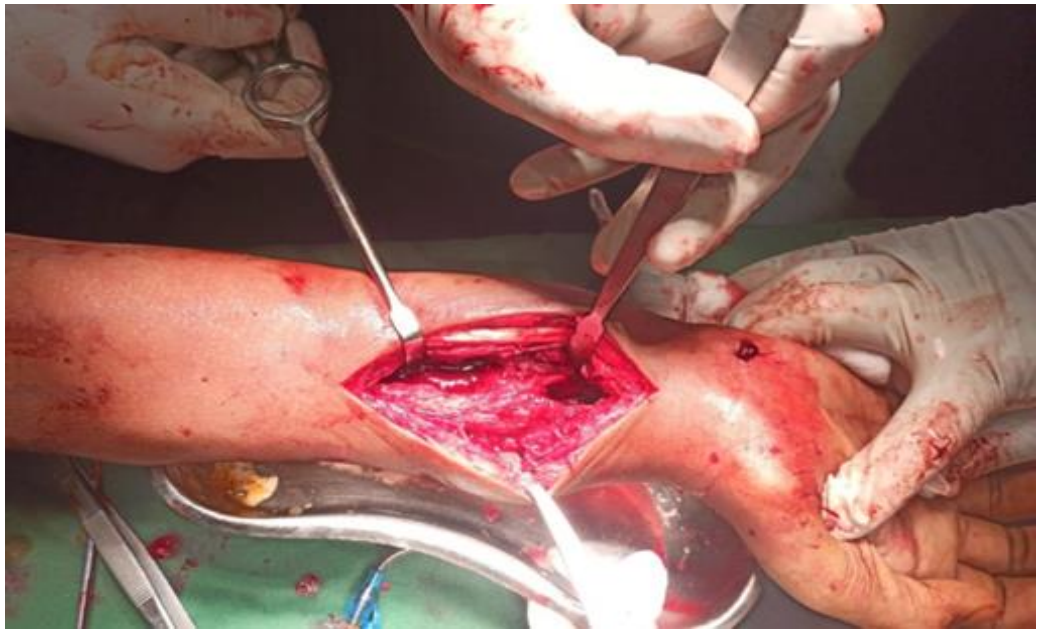
- Debridement with Volar approach followed by uniplanar, unilateral external fixation was done with use of Bio Stimulant under general anaesthesia.

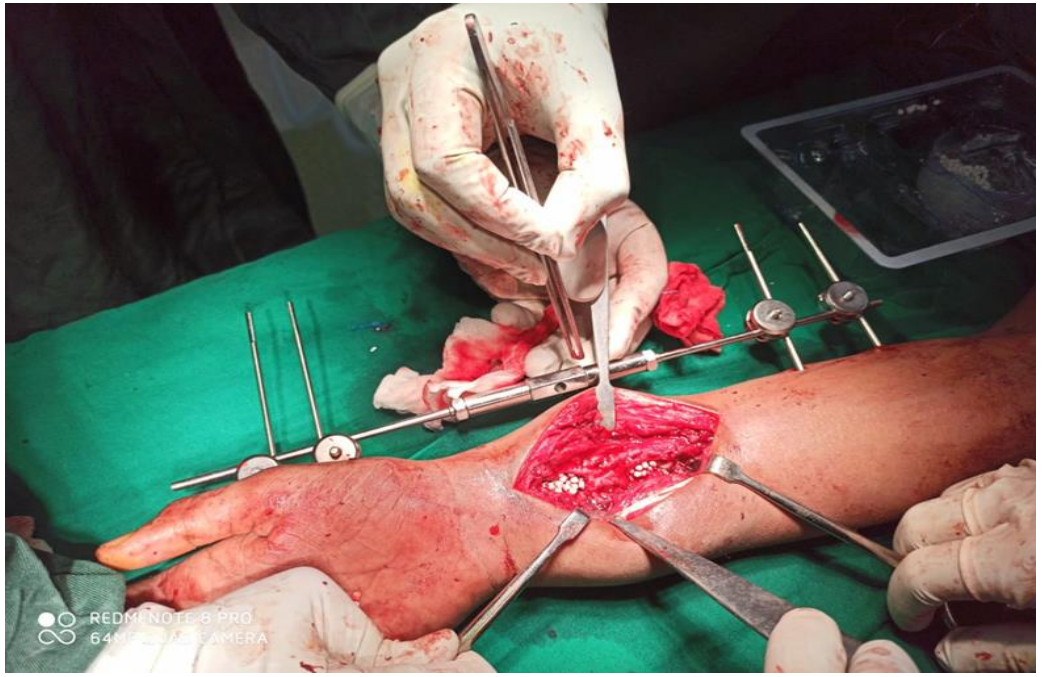
Bio stimulant beads on table preparation







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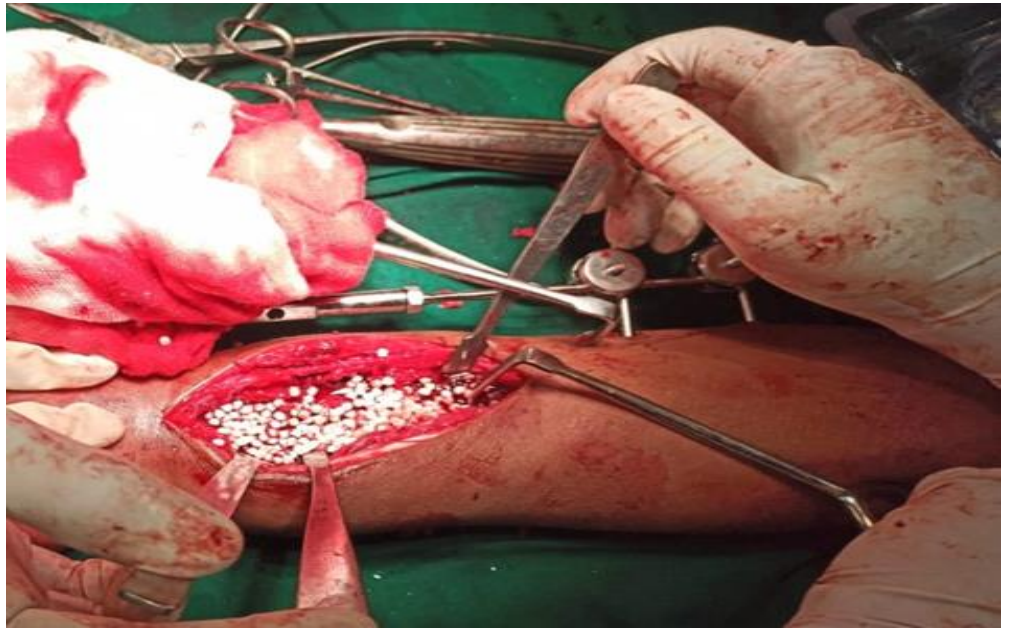
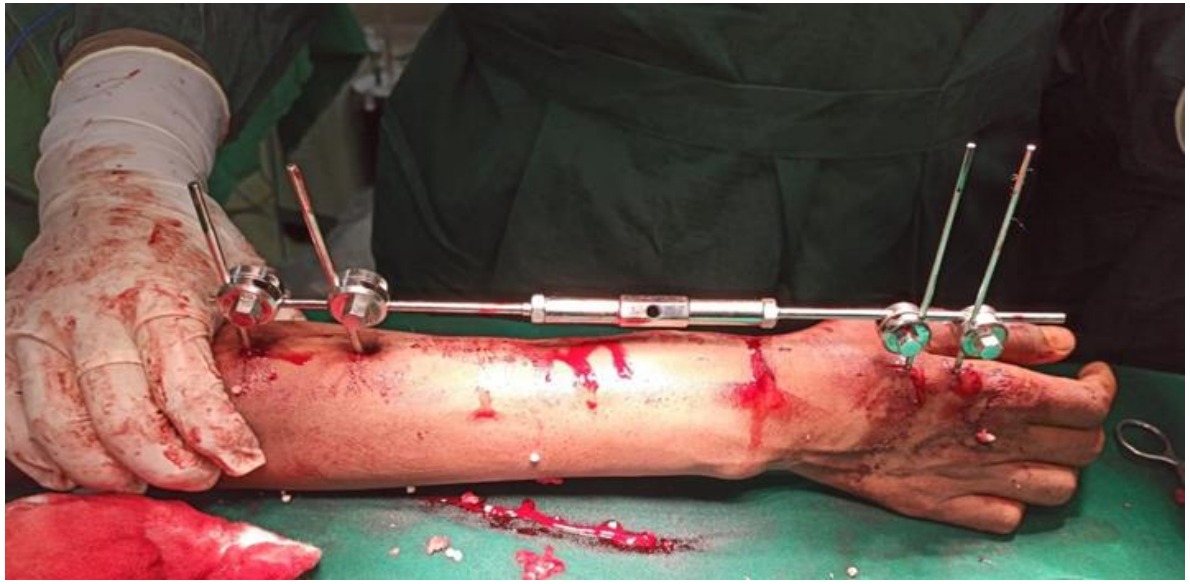
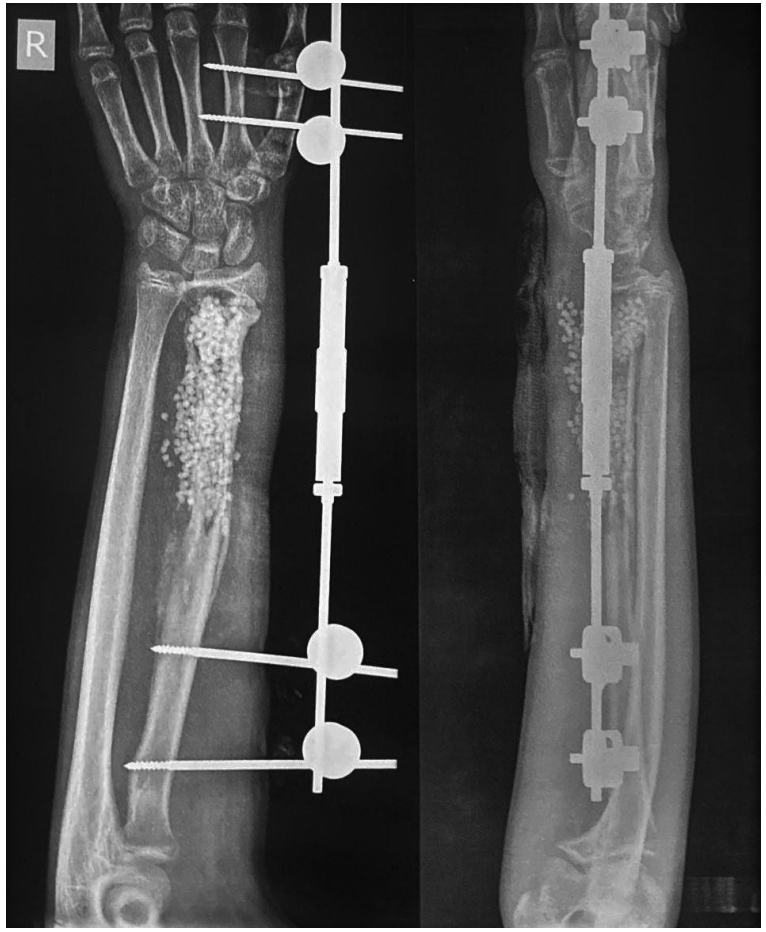




Post Op X-Ray

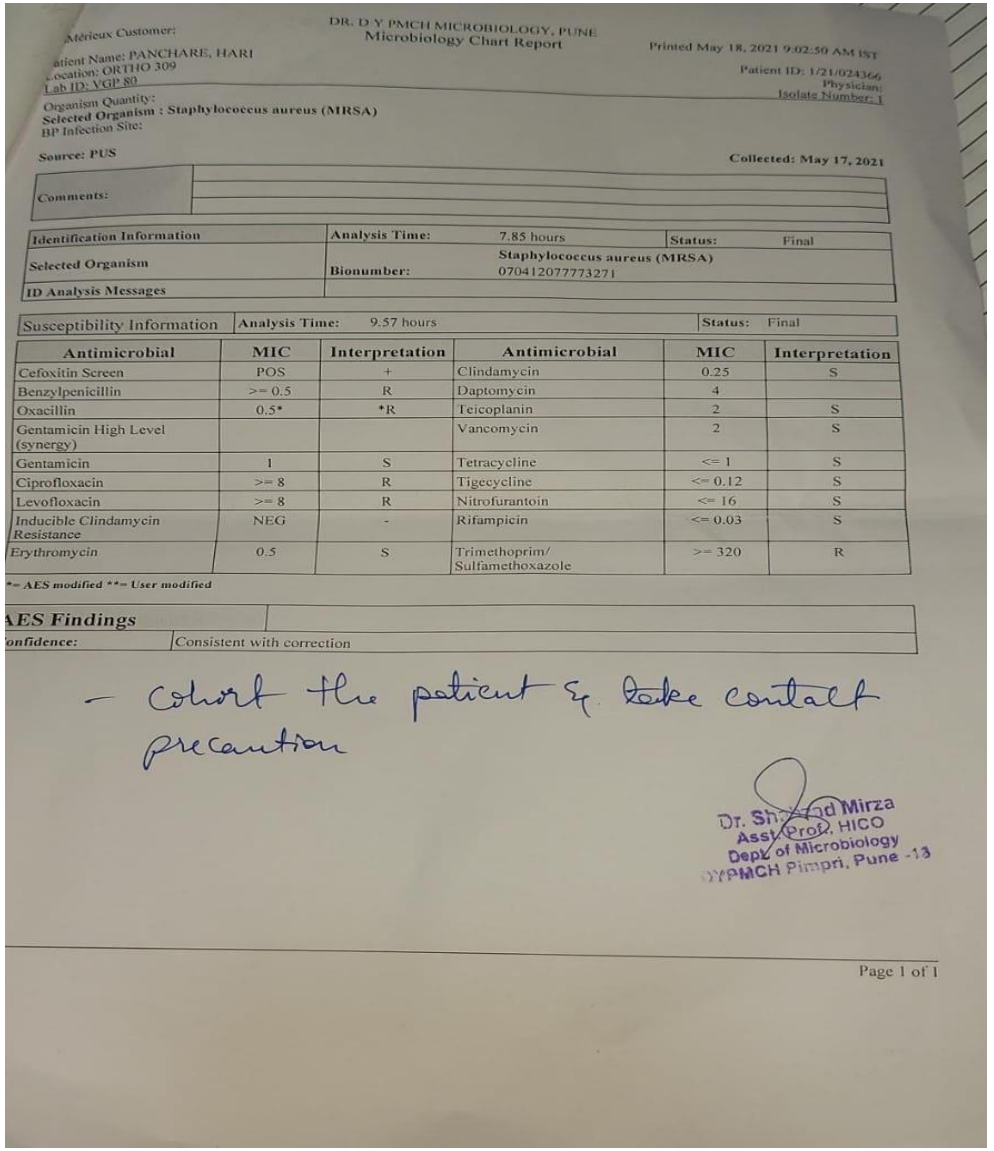


Post Op (Day 0) Xray

Post Op (Day 14) Xray

Pus culture from the intraoperative sample.

Methicillin resistant staphylococcus aureus(MRSA) was isolated from the culture of the pus from the intraoperative site.



DR. D.Y.PMCH MICROBIOLOGY, PUNE
Microbiology Chart Report

Mérieux Customer:
Patient Name: PANCHARE, HARI
Location: ORTHO 309
Lab ID: VGP 80
Printed May 18, 2021 9:02:50 AM IST
Patient ID: 1/21/024366
Physician:
Isolate Number: 1

Organism Quantity:
Selected Organism : Staphylococcus aureus (MRSA)
BP Infection Site:

Source: PUS
Collected: May 17, 2021

Comments:

Identification Information	**Analysis Time:** 7.85 hours	**Status:**	Final
Selected Organism	**Bionumber:**	**Staphylococcus aureus (MRSA)** 070412077773271	
ID Analysis Messages			

Susceptibility Information	Analysis Time: 9.57 hours	Status: Final

Antimicrobial	MIC	Interpretation	Antimicrobial	MIC	Interpretation
Cefoxitin Screen	POS	+	Clindamycin	0.25	S
Benzylpenicillin	>= 0.5	R	Daptomycin	4	
Oxacillin	0.5*	*R	Teicoplanin	2	S
Gentamicin High Level (synergy)			Vancomycin	2	S
Gentamicin	1	S	Tetracycline	<= 1	S
Ciprofloxacin	>= 8	R	Tigecycline	<= 0.12	S
Levofloxacin	>= 8	R	Nitrofurantoin	<= 16	S
Inducible Clindamycin Resistance	NEG	-	Rifampicin	<= 0.03	S
Erythromycin	0.5	S	Trimethoprim/ Sulfamethoxazole	>= 320	R

*= AES modified **= User modified

AES Findings
Confidence: Consistent with correction

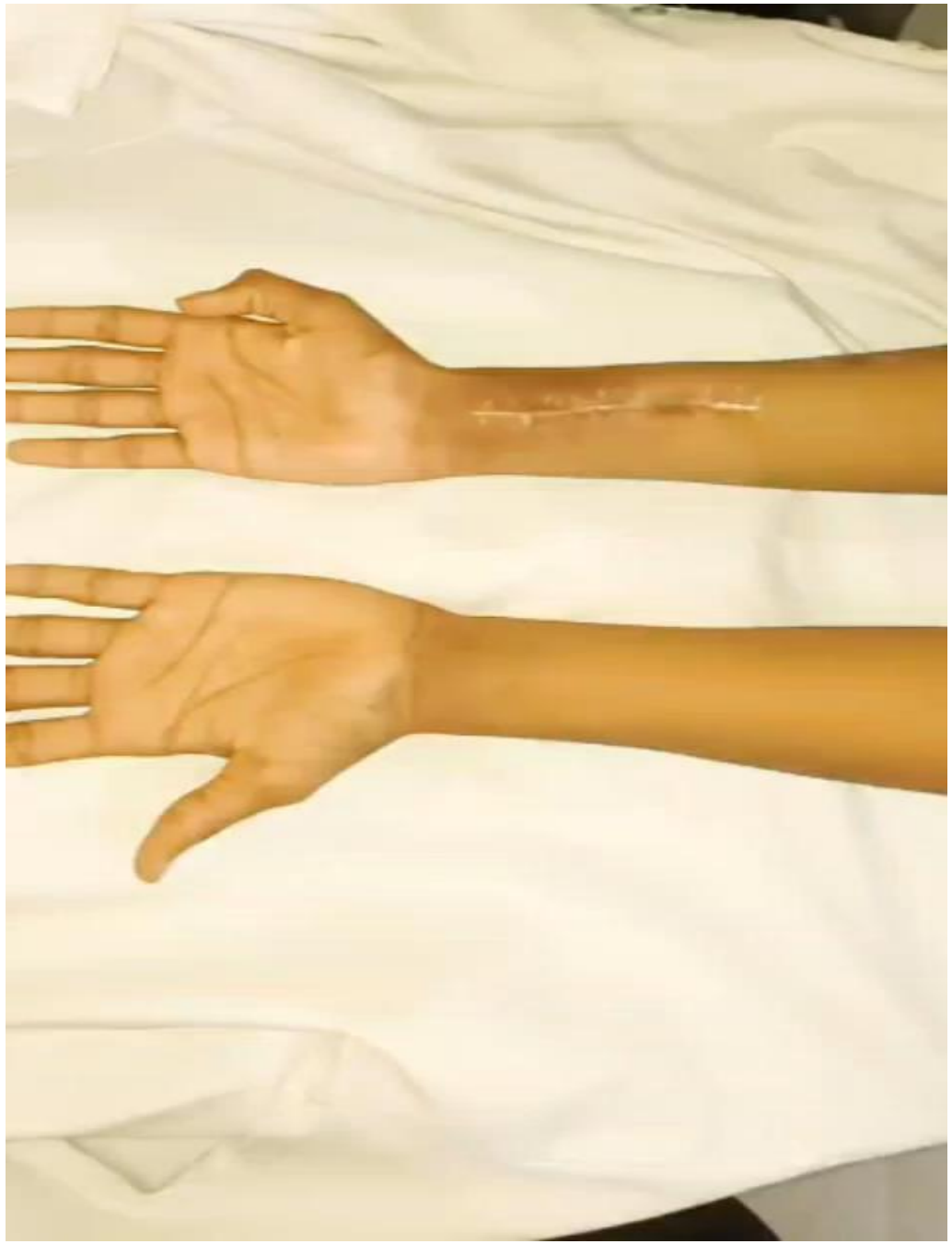
- Cohort the patient & take contact precaution

Dr. Shazad Mirza
Asst. Prof. HICO
Dept of Microbiology
DYPMCH Pimpri, Pune -18

Page 1 of 1

3 month follow up-

Range of motion after 3 months.



Case 2
A Case of Osteomyelitis of Distal Third of Right Tibia

Introduction

- A 7 year old male came with complaints of pain in right distal tibia since 10 days.
- H/o blunt trauma present 3 months back.
- o/e

Right distal one third of leg:

-Tenderness, swelling present over distal third tibia

-Range of motion is restricted at the ankle joint.

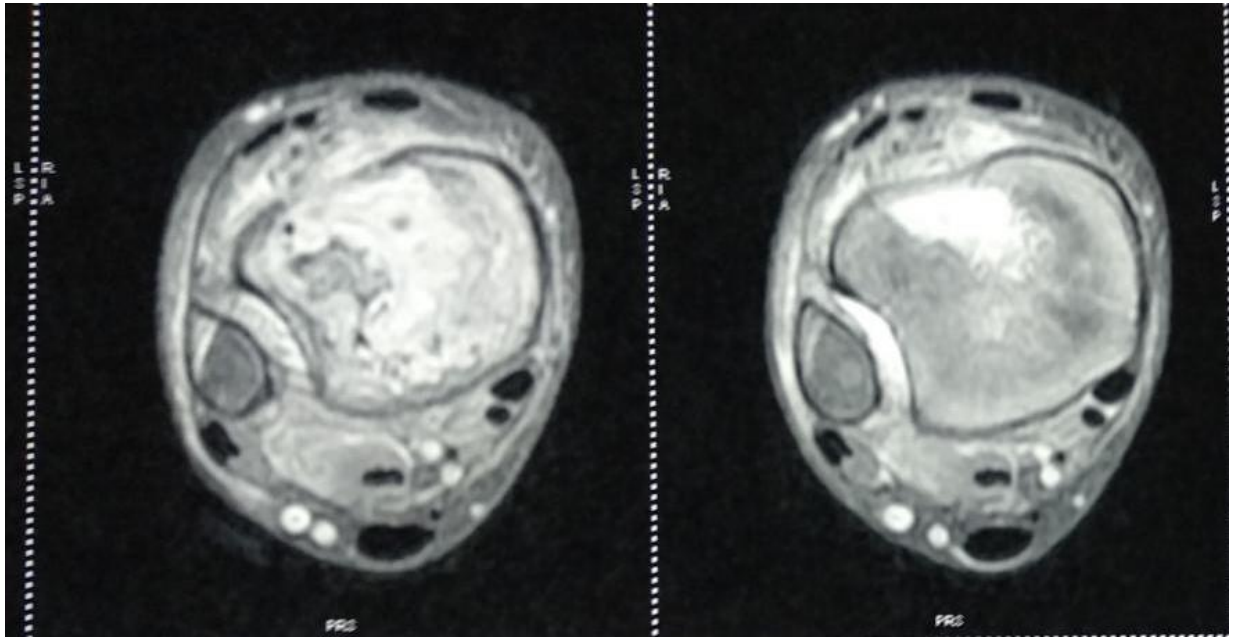
-No distal neuro-vascular compromise present

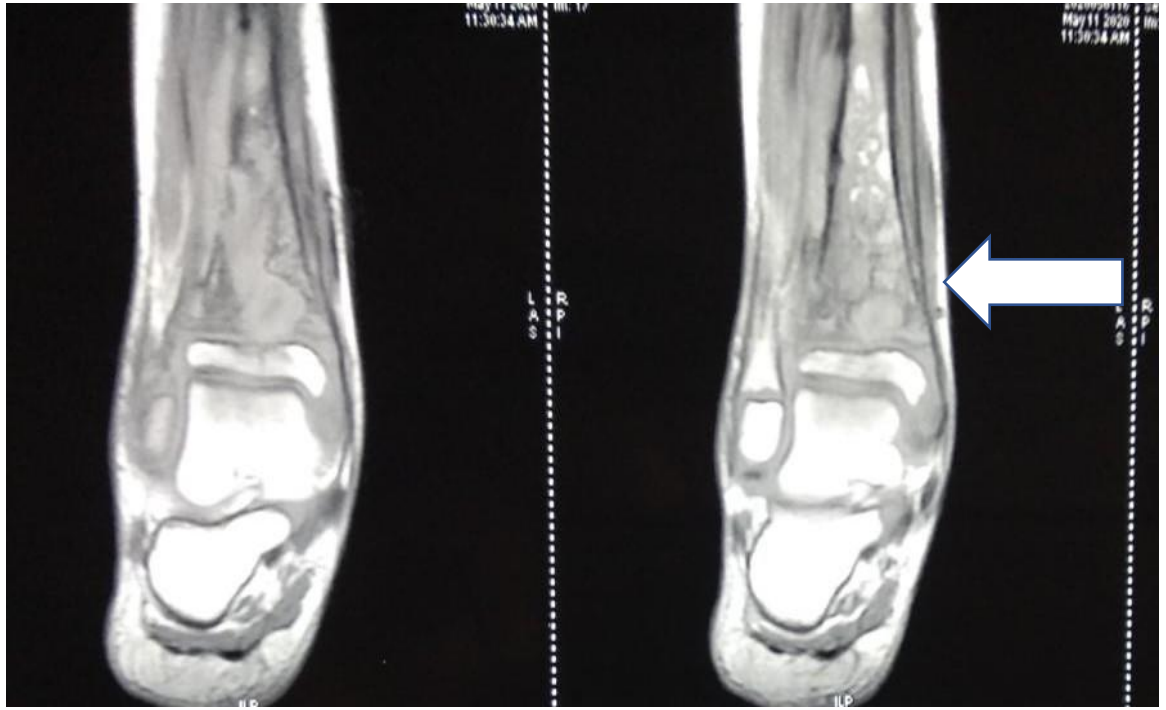
Clinical Photos

X-ray

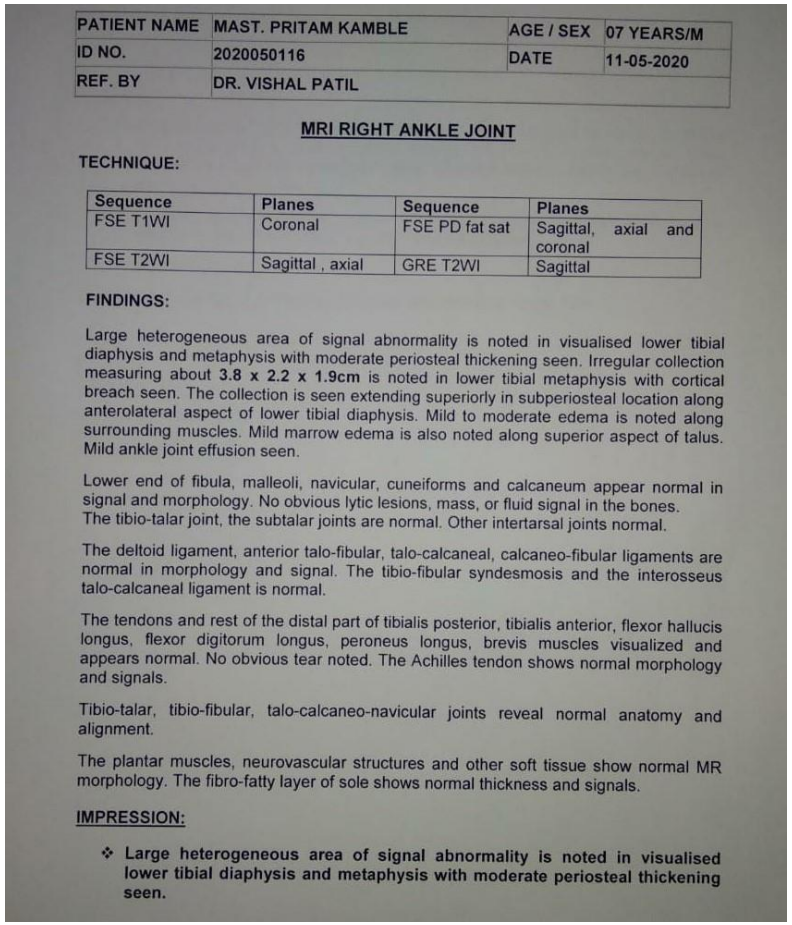
- Sequestrum seen at distal tibia
- Periosteal bone reaction
- Sclerosis of bone seen
- Focal bone lysis
- Loss of cortical bone

MRI





MRI Report- s/o of chronic Osteomyelitis



PATIENT NAME	MAST. PRITAM KAMBLE	AGE / SEX	07 YEARS/M
ID NO.	2020050116	DATE	11-05-2020
REF. BY	DR. VISHAL PATIL		

MRI RIGHT ANKLE JOINT

TECHNIQUE:

Sequence	Planes	Sequence	Planes
FSE T1WI	Coronal	FSE PD fat sat	Sagittal, axial and coronal
FSE T2WI	Sagittal , axial	GRE T2WI	Sagittal

FINDINGS:

Large heterogeneous area of signal abnormality is noted in visualised lower tibial diaphysis and metaphysis with moderate periosteal thickening seen. Irregular collection measuring about **3.8 x 2.2 x 1.9cm** is noted in lower tibial metaphysis with cortical breach seen. The collection is seen extending superiorly in subperiosteal location along anterolateral aspect of lower tibial diaphysis. Mild to moderate edema is noted along surrounding muscles. Mild marrow edema is also noted along superior aspect of talus. Mild ankle joint effusion seen.

Lower end of fibula, malleoli, navicular, cuneiforms and calcaneum appear normal in signal and morphology. No obvious lytic lesions, mass, or fluid signal in the bones. The tibio-talar joint, the subtalar joints are normal. Other intertarsal joints normal.

The deltoid ligament, anterior talo-fibular, talo-calcaneal, calcaneo-fibular ligaments are normal in morphology and signal. The tibio-fibular syndesmosis and the interosseus talo-calcaneal ligament is normal.

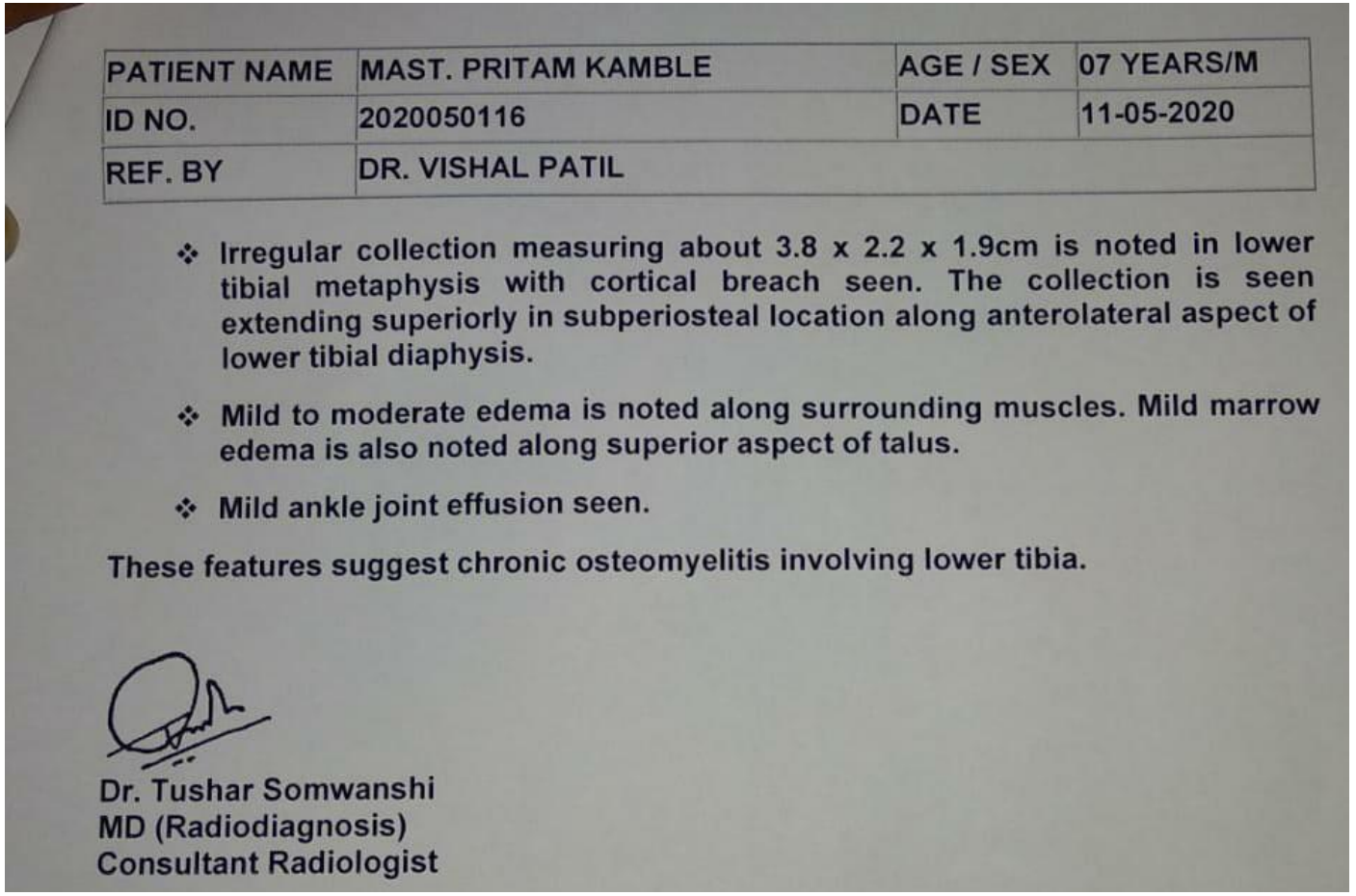
The tendons and rest of the distal part of tibialis posterior, tibialis anterior, flexor hallucis longus, flexor digitorum longus, peroneus longus, brevis muscles visualized and appears normal. No obvious tear noted. The Achilles tendon shows normal morphology and signals.

Tibio-talar, tibio-fibular, talo-calcaneo-navicular joints reveal normal anatomy and alignment.

The plantar muscles, neurovascular structures and other soft tissue show normal MR morphology. The fibro-fatty layer of sole shows normal thickness and signals.

IMPRESSION:

- **Large heterogeneous area of signal abnormality is noted in visualised lower tibial diaphysis and metaphysis with moderate periosteal thickening seen.**



PATIENT NAME	MAST. PRITAM KAMBLE	AGE / SEX	07 YEARS/M
ID NO.	2020050116	DATE	11-05-2020
REF. BY	DR. VISHAL PATIL		

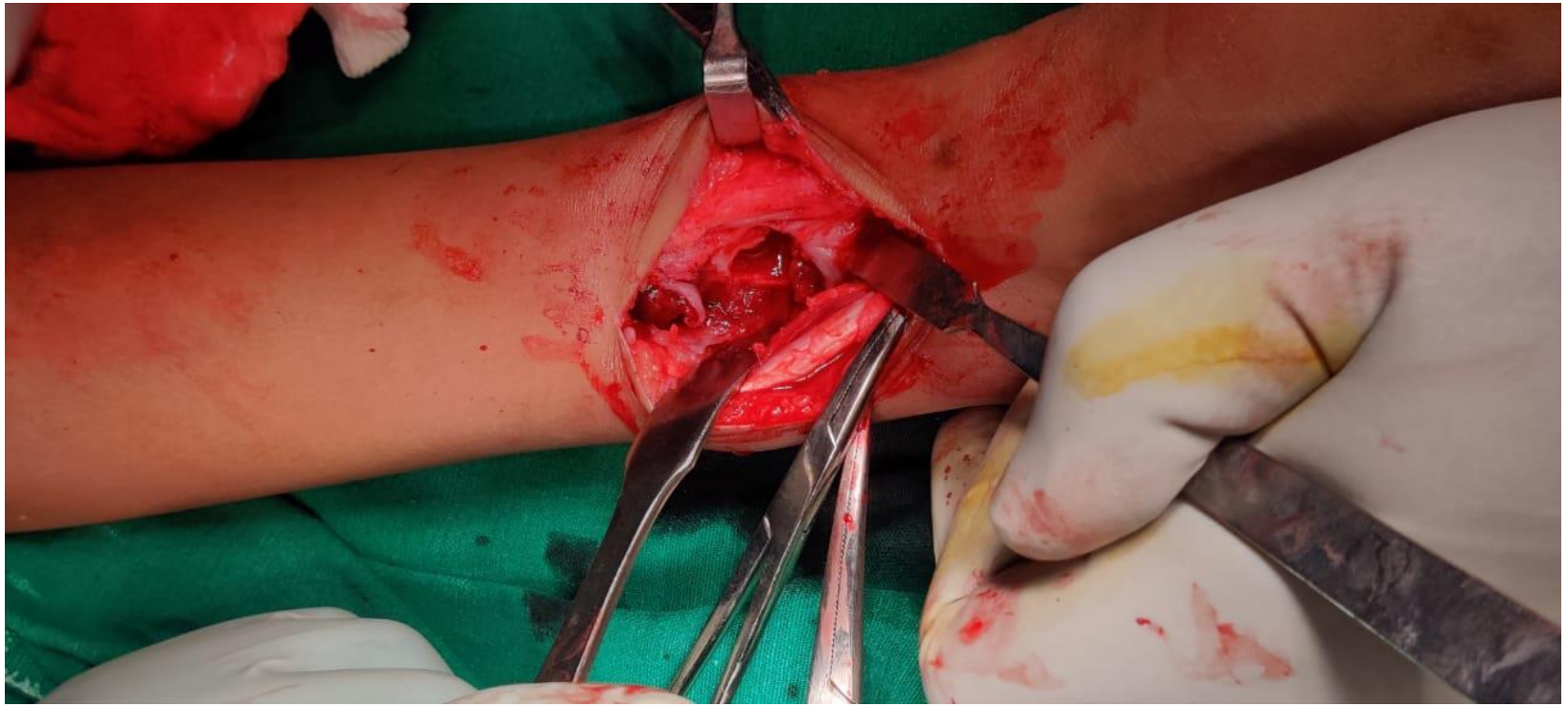
- Irregular collection measuring about 3.8 x 2.2 x 1.9cm is noted in lower tibial metaphysis with cortical breach seen. The collection is seen extending superiorly in subperiosteal location along anterolateral aspect of lower tibial diaphysis.
- Mild to moderate edema is noted along surrounding muscles. Mild marrow edema is also noted along superior aspect of talus.
- Mild ankle joint effusion seen.

These features suggest chronic osteomyelitis involving lower tibia.

Dr. Tushar Somwanshi
MD (Radiodiagnosis)
Consultant Radiologist

Surgical Management

- Debridement followed by bio stimulan beads were used.



Post op x-ray

Right Ankle anterio-posterior, lateral and mortise view

Post op day 0 Right ankle xray

Right tibia anterio-posterior, lateral view

Post op day 0 Right tibia xray

Follow up X-rays

Right ankle anterio-posterior,lateral,mortise view

14th day follow up x-ray

Right tibia anterio-posterior,lateral view

14th day follow up x ray

Follow up x-rays

- Healing process has started appearing
- Decreased periosteal reaction
- Increased Lateral cortical thickening
- Decreased focal bony lysis seen
- Regrowth of trabecular bone architecture

Follow up x ray after 3 weeks

Patella tendon weight relieving orthoses was given at 4 weeks to the patient.

- Improves biomechanics
- Superior alignment
- Lighter weight
- Ease and constancy of application
- Minimal maintenance

DISCUSSION

Osteomyelitis in children

- Hematogenous route is commonest in pediatric age group .
- Most common organisms:- Staph Aureus 90% of cases.
- Much more common in long tubular bones than flat bones.

Bone cement(PMMA)	Calcium sulphate(bio synthetic stimulan)
Can provide substrate for bacterial colonization as antibiotic released decreases over time	Release their entire antibiotic load after degredation leaving no substrate for bacterial colonization
Surgical treatment for removal of beads required	No surgical removal required as it is biodegradable
Multiple surgeries may be needed for infection control	Single surgery is enough for infection control
Bone cement is not biodegradable	This is biodegrable

Calcium sulphate (bio-stimulan)

- It is inexpensive
- Available in different forms
- Osteoconductive
- Resorbs rapidly in 1-3 months
- Its biodegradable
- Prevents ingrowth of soft tissues

- One study reported 26 patients with chronic osteomyelitis with vancomycine impregated beads. The results were satisfactory in all patients , who were ambulatory and had returned to there pre treatment activity level or better at last follow up.
- One such study was conducted in dy patil hospital on total of 10 patients where the results for 7 patients were excellent and other 3 needed revision surgery
- This study is approved and will be published in secot conference.