PUSHING THE ENVELOPE CONFERENCE SAN DIEGO 2017

ANTIBIOTIC CEMENT SPACERS

VENTURA COUNTY MEDICAL CENTER

Community Memorial Health System

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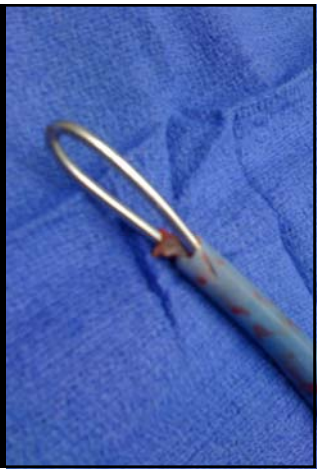
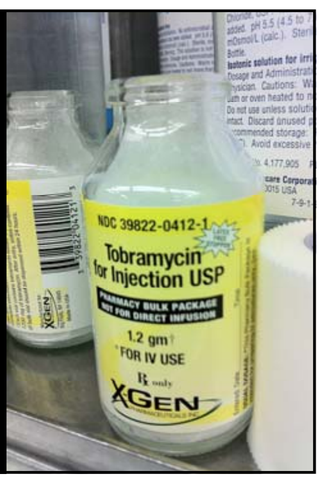
OBJECTIVES

- Advantages
- Indications
- Components
- Surgical Technique
- Results
- Case examples



ADVANTAGES

- Delivery of high local concentrations
- Manages dead space
- Inexpensive
- Easy to insert/remove
- Effective
- Bioactive induced membrane
- Lots of shape options
- Can be made in advance



INDICATIONS

- Prevention of osteomyelitis in open fractures
- Treatment of acute and chronic osteomyelitis
- Suppressive antibiotics to buy time for fracture healing
- Fracture stability
- Bone defects

CONTRAINDICATIONS

- patient allergies
- small spaces
- unsalvageable limbs
- slime-producing bacteria (enterococcus)
- Vacuum dressings or open wounds

COMPONENTS

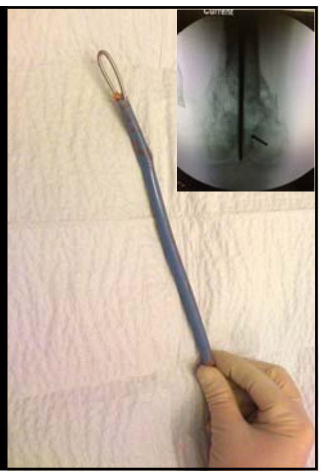
- PMMA Cement: porous
- Antibiotic: heat stable, broad spectrum, water soluble, powder
- Vanco 2gm per 1 bag
- Tobra 2.4gm per 1 bag
- Non-absorbable suture or wires

SURGICAL TECHNIQUE: BEADS

- Remove existing hardware
- Thorough I&D of all non-viable soft tissue and bone
- Measure and assemble cement spacer
- hand-made or molds
- 1 bag of cement + 2 bottles of abx + 1 or 1.5 bottles of monomer

SURGICAL TECHNIQUE: IM NAIL

- Mix cement with abx
- Use cement gun to squirt into large chest tube
- Bend ball-tipped guide wire and insert into wet cement within chest tube
- Use 10 blade to cut tube
- Tie suture to guide wire



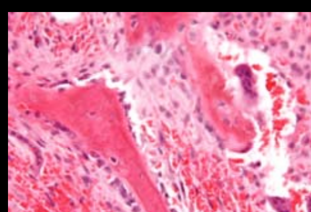
SURGICAL TECHNIQUE: MASQUELET

- Form spacer around nail or in shape of bone
- Cut in half
- Insert into defect
- Remove or irrigate to cool

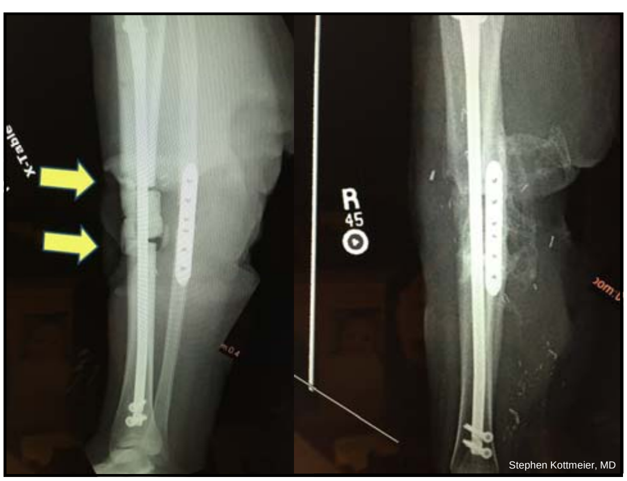
SURGICAL TECHNIQUE: MASQUELET

- Induced membrane
- Freshen bone ends
- Fill with autograft
- 4-8 weeks

MASQUELET TECHNIQUE: BASIC SCIENCE



- type I collagen matrix with fibroblasts
- vascular endothelial growth factor
- core-binding factor alpha-1
- transforming growth factor beta-1
- bone morphogenic protein-2
- stimulates bone marrow cell proliferation and mesenchymal cell differentiation to osteoblasts



COMPLICATIONS

- Difficulty in retrieval
- Allergic reactions
- Resistant or recurrent infection
- Nonunion
- Stress fracture

RESULTS

- Very little known about clinical success rates for beads & nails
- Induced membrane results are >90% successful for union
- Best elution during first 4 days
- local concentrations 200 times stronger than IV
- Can repeat the process if no success after first spacer

CASE 1 HUMERUS

- 40 year old homeless male s/p ORIF with MSSA infected early hardware failure at 2wks post op

- Revision ORIF with subcutaneous spacer

- Revised to AICN with hardware removal and I&D
- Left in place for 6 weeks

- Replaced with titanium intramedullary nail

CASE 2
FEMUR

- 55 year old male Diabetic s/p mechanical fall with 3 weeks of preceding femur pain
- Osteomyelitis, septic shock at time of presentation
- Exfix and I&D performed prior to transfer

CASE 2
FEMUR

- Repeat I&D with antibiotic cement beads placed
- Exfix revised

CASE 2
FEMUR

- Healed with leg length inequality and knee stiffness

PUSHING THE ENVELOPE

- Porogens to increase porosity
- gelatin powder
- hydroxyapatite/CaPhos
- combination antibiotics
- alternatives to PMMA

SUMMARY

- Cheap
- Easy, versatile
- Works well
- Off-label
- Very few complications

REFERENCES

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THANK YOU