Procedures and lacerations in LTC

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Question 1

- A resident slid out of his wheelchair and sustained laceration to the scalp. He is not on any anti-coagulant.
- His GCS is 15/15 and his behavior is at baseline.



HOW CAN YOU MANAGE THIS LACERATION?

WHAT FACTORS WILL YOU CONSIDER?

Factors to consider

- Length of the laceration?
- Morphology of the laceration?
- Depth of the laceration?
- Other organs involved (ears, eyes)?
- Other injuries?
- Medications?

Factors to consider

- Level of alertness?
- Amount of bleeding?
- Anti-coagulation?
- Cosmetic result?

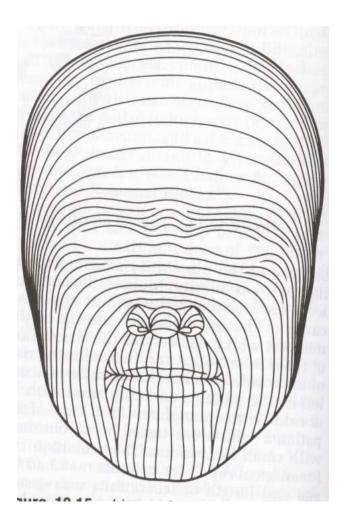
History

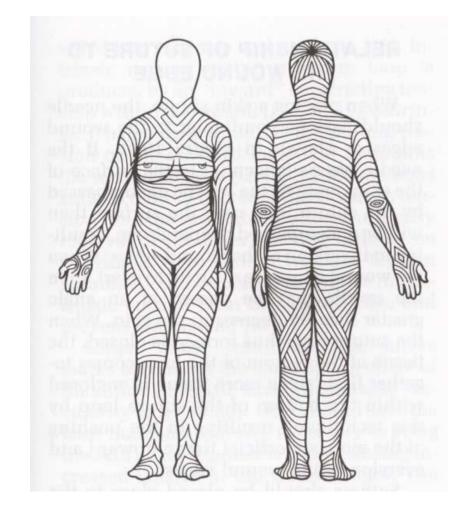
- Factors for poor scar healing
 - Extreme Ages
 - Co-morbidity
 - Diabetes, Renal Insufficiency, Obesity, Malnutrition
 - Immunosupressors
 - Connective tissue disease
 - Surfaces of high tension

History

- Factors increasing infection
 - Region of poor vascularization
 - Compression forces
 - Shearing

History





Question 2

- How will you anesthetize the wound?
- What will you use?
- How can you minimize pain of infiltration?

Anesthesia – reduce pain of injection

- Addition of Sodium Bicarbonate
- Rewarm anesthetic agent
- Needle of small caliber (>= 25)
- Slow infiltration
- Inject directly within the wound
- Pre-treat with topical anesthesia

Digital Block

- Keith Denkler, MD
- Plastic and Reconstructive Surgery, July 2001, 108(1); 114-124
- Index Medicus 1880-1966
- National Library of Medicine of Database 1966-2000

- 48 cases of digital gangrene
 - 21 due to epinephrine (more than 50 years ago)
 - 17 due to solution of
 Epi of unknown
 concentration
- O cases with commercial lidocaine + epinephrine (introduced in 1948)

Digital Block

- Secure
 - De Rougemont and Carcassone, 1948
 - 1500 blocks with epinephrine 1:100 000
 - Burnham , 1958
 - 93 blocks with epinephrine 1:200 000
 - Johnson, 1967
 - 98 blocks
 - Steinberg et Block, 1971
 - > 200 000 toe blocks
 - Sylaidis, 1998
 - 100 blocks with epinephrine 1:80 000

Digital Block

Risk Factors

- Cocaine, Eukaine, Water
- Post-op hot water soaks (burns)
- Excessive quantity of solution
- Circumferential Block
- Tourniquet?
- Infection

Recommendations

- Commercial lidocaine + epinephrine
- Avoid hot soaks
- Small quantities
- Avoid circumferential
- No tourniquet
- Avoid epinephrine with certain patients
- Avoid compressive bandages
- Metacarpal blocks
- Small needle
- Buffer lidocaine
- Adequate follow-up

Irrigation - Pressure

- Adequate irrigation reduces bacterial contamination
- Pressure 5-8 psi

Irrigation - Solution

- NaCl 0.9%
- Avoid
 - Povidone-iodine
 - Chlorhexidine
 - Hydrogen peroxide

Irrigation – Tap Water

- Lower infection rate
- Comparable to NaCl 0.9% (scarring, infection)
- Good alternative to NaCl 0.9%

Preparation

Debridement

- Remove all devitalized tissues
- Reduce infection rate

Hair removal

- Source of contamination
- Complicates wound approximation
- Shaving allows bacterial invasion
- Clipping

Foreign Body

- Consider possibility of FB with each laceration
- Certain lacerations are more at risk
- Sensation FB must be taken seriously
- Exploration with hemostat must be done under direct visualization
- Imaging (Xray or U/S) may be useful

MATERIALS

Absorbable Sutures

- Catgut plain and chromic
 - From cattle or sheep
 - Uses limited today episiotomy, cosmetic surgery
- Polyglycolic acid (Dexon)
 - First synthetic absorbable suture material
 - Braided polymer binds and snags
- Polyglactic acid (Vicryl)
 - Lubricated braided polymer
 - Retains tensile strength for 3-4 weeks
 - Absorbed in 60-90 days

- Polydioxanone (PDS)
 - Monofilament, poor handling
 - 58% of tensile strength at 4 weeks
 - Not absorbed until 190 days
- Polyglyconate (Maxon)
 - Monofilament
 - Retains tensile strength –
 59% at 28 days
 - Much easier to handle

Non-Absorbable Sutures

- Silk
 - Braided natural protein
 - Best handling and tying characteristics
 - Very low tensile strength, high tissue reaction
- Nylon (Ethilon, Dermalon)
 - Monofilament, first synthetic suture material
 - High tensile strength, minimal tissue reaction and low cost
 - High memory needs 3-4 knots to hold

- Polypropylene (Proline, Surgilene)
 - High tensile strength and extremely inert
 - Poor knot security, but easily removed
- Polybutester (Novafil)
 - Monofilament
 - High tensile strength
 - Greater elasticity (stretch and recoil)

Other Wound Closure Materials

- Steri-strips
- Staples
- Tissue Adhesives

Steri-strips

- Do not require anesthesia
- Flat, dry, nonmobile wound edges without tension
- Less infection rate



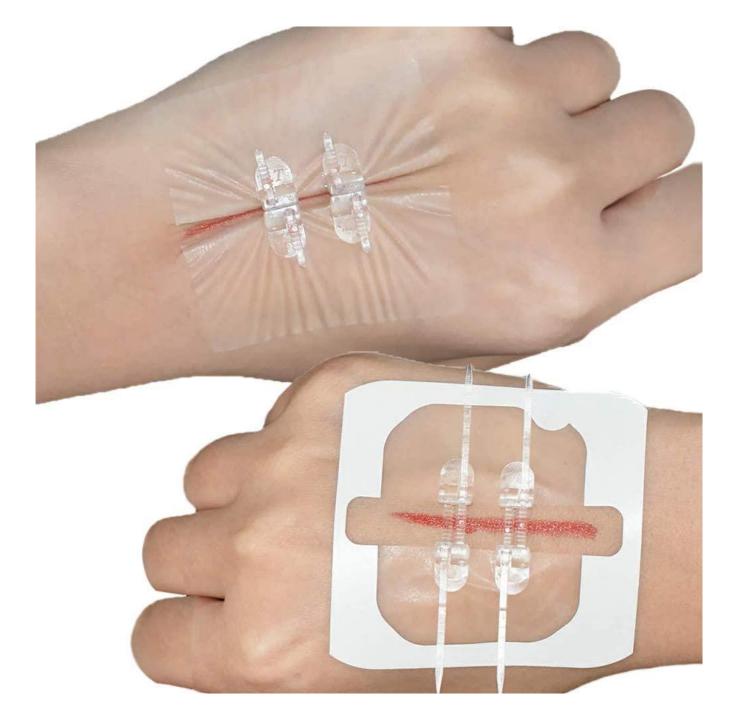


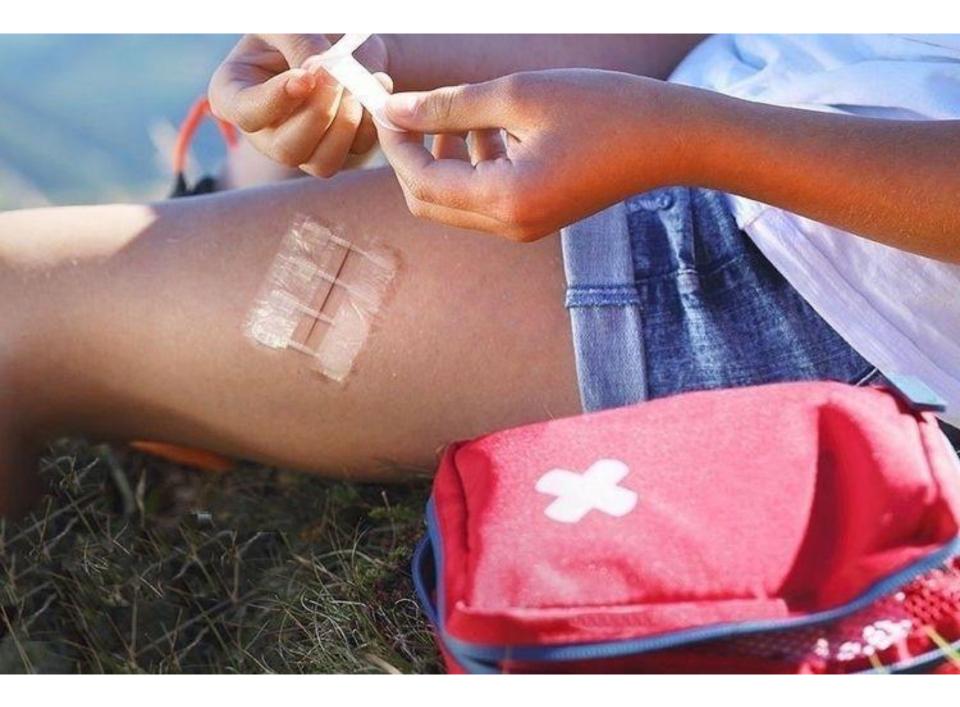
Steri-strips

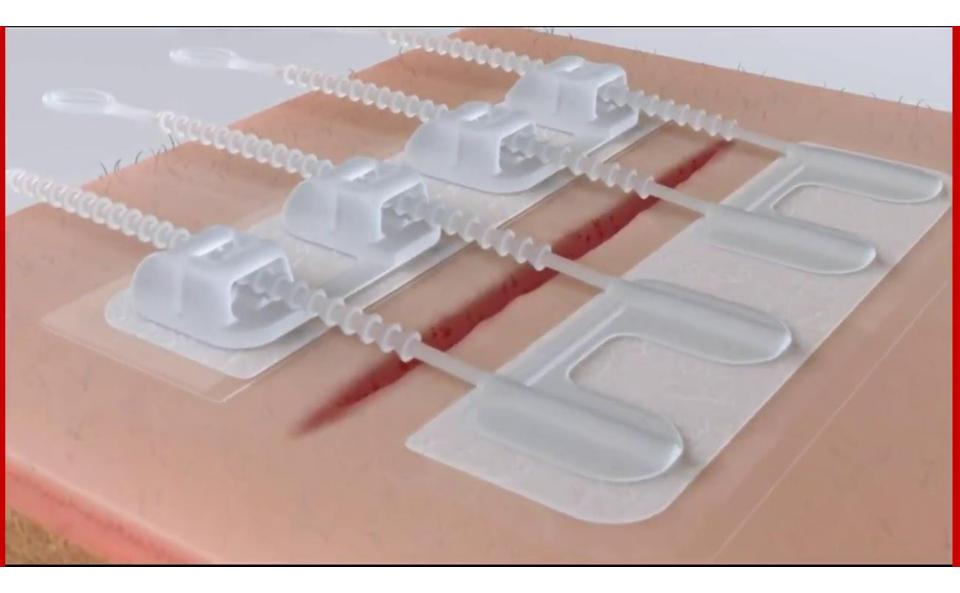
<u>Advantages</u>

Disadvantages

Anesthesia not necessary No suture marks Low cutaneous reaction Easy application Not applicable to oily surfaces No eversion Premature removal Not for high tension articulation/ surface









Staples

- Simple linear lacerations of scalp, trunk, arms and legs
- Not for hands, feet or cosmetic repairs
- Faster, less costly, equal healing and scarring to sutures

- Lower reaction rate to FB
- Lower infection rate
- Useful for scalp, trunk, extremities
- Optimal lacerations
 - Clean
 - Clean region
 - Linear







Tissue Adhesives

- Cyanoacrylate polymers
- Less painful and faster application than sutures
- Waterproof and antimicrobial barriers
- No suture removal
- Comparable wound closure results

- Disappears in 7-10 days
- Region of low tension
- Surface has to be dry
- Acts as protective coating
- Potential in reducing infection (Quinn JV, 1995)
- Not indicated for mucosa

Tissue Adhesives

- Can be applied on...
 - Steri-strip
 - Deep sutures

Prospective, Randomized, Controlled Trial Comparing a Tissue Adhesive (Dermabond™) with Adhesive Strips (Steri-Strips™) for the Closure of Laparoscopic Trocar Wounds in Children

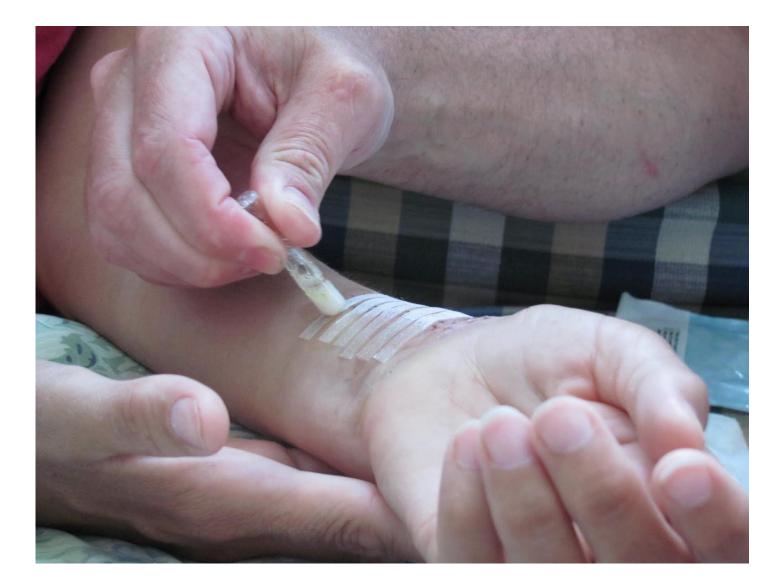
Authors

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Affiliation

University of Heidelberg, Department of Surgery, Section Pediatric Surgery, Heidelberg, Germany

Tissue Adhesives



Question 3

• You cannot find a pair of sterile gloves your size. Is it important?

Whether the rate of infection after repair of uncomplicated laceration in immunocompetent patients is comparable using clean nonsterile gloves vs sterile gloves

- Prospective study
- 816 individuals
- Randomized to clean nonsterile gloves vs sterile gloves
- Questionnaire for the
 - Physician at the time of repair
 - Patient to hand to the physician at the time of suture removal
 - Telephone call if follow-up questionnaire forms were unavailable

- Results
 - Follow-up in 98% of sterile group
 - Follow-up in 96.6% of clean nonsterile group
 - No statistically significant difference in incidence of infection between the 2 groups
 - 6.1% in the sterile glove group (95% CI, 3.8-8.4%)
 - 4.4% in the clean glove group (95% Cl, 2.4-6.4%)

No clinically important difference in infection rate between using clean nonsterile gloves and sterile gloves during the repair of uncomplicated traumatic lacerations

Question 4

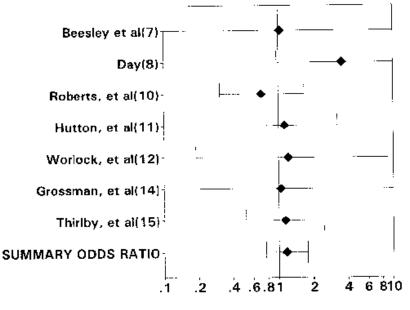
- You have just repaired a laceration on a thigh. The laceration was caused by a fall. Should I provide prophylactic antibiotics?
- A. Yes, definitely
- B. No, I should not
- C. I am not sure, can I call my grand-mama?
- D. I don't care

Question 5

- You have just repaired a laceration on a forearm. The laceration was caused by the bite from another resident. Should I provide prophylactic antibiotics?
- A. Yes, definitely
- B. No, I should not
- C. I am not sure, can I call my grand-mama?
- D. I don't care

Prophylactic Antibiotics

- Meta-analysis
- 1966-1993
- OR 1.16 (0.91-1.41)
- Not recommended
- Usage based on
 - Degree of contamination
 - Infection risk factors
 - Human, dog, or cat bites



Odds Ratio

Prophylactic Antibiotics

- Mammalian bites
- Prospective, randomized
- Significant
 - Human bites
 - Hand bites
- Non-significant
 - Cats and dog bites
 - Laceration types (laceration vs puncture wound)

Prophylactic Antibiotics

- Open Fractures
 - Staph Aureus, Streptococcus
- Human Bites
 - Eikenella Corrodens
- Dog and Cat bites
 - Pasteurella Multocida

Bower M, April 2001. Capellan & Hollander, Feb 2003

Suggested Antibiotic Regimens

Dog Bite

Etiologies: Viridans streptococci, Pasteurella multocida, Eikenella corroddens, Bacteroides, Fusobacterium, Capnocytophaga

Primary Regimen*: Amoxicillin/clavulanic acid 875/125 mg b.i.d. orally or 500/125 mg t.i.d. orally

Altemate Regimen: Adults allergic to penicillin: clindamycin 300 mg q.i.d. orally and a fluoroquinolone Children allergic to penicillin: clindamycin and trimethoprim-sulfamethoxazole

Comments: Capnocytophaga in splenectomized patients may cause sepsis with disseminated intravascular coagulation; *P. multocida* is resistant to dicloxacillin, cephalexin, clindamycin, and erythromycin

Cat Bite

Etiologies: P. multocida, Staphylococcus aureus

Primary Regimen*: Amoxicillin/clavulanic acid 875/125 mg b.i.d. orally or 500/125 mg t.i.d. orally

Alternate Regimen: Adults allergic to penicillin: cefuroxime 500 mg orally every 12 hours or doxycycline 100 mg b.i.d. orally (cephalexin should not be used)

Children allergic to penicillin: cefuroximine (cephalexin should not be used)

Comments: 80% of cat bites become infected; *P. multocida* is resistant to dicloxacillin, cephalexin, clindamycin, and erythromycin; *P. multocida* infection develops within 24 hours; observe for osteomyelitis; if culture shows only *P. multocida*, switch to oral penicillin or penicillin G I.V.

Human Bite

Etiologies: V. streptococci, (100%) Staphylococcus epidermis (53%), Corynebacterium, (41%), S. aureus (29%), Eikenella (15%), Bacteroides (82%), Peptostreptococcus (26%)

Primary Regimen*: Prophylactic: oral amoxicillin/clavulanic acid 875/125 mg b.i.d. orally for 5 days

Therapeutic: I.V. ampicillin/sulbactam (Unasyn) 1.5 grams every 6 hours I.V. or cefoxitin 2 grams every 8 hours I.V. or ticarcillin/clavulanate potassium 3.1 grams every 6 hours I.V. or piperacillin/tazobactam 3.375 grams every 6 hours I.V.

Alternate Regimen: Adults allergic to penicillin: clindamycin and either ciprofloxacin or trimethoprim/sulfamethoxazole Children allergic to penicillin: clindamycin and trimethoprim/sulfamethoxazole

Comments: Cleaning, irrigation, and debridement are imperative; for closed-fist injuries, obtain x-rays; signs of infection usually seen in less than 24 hours; treat therapeutically

*Adult doses

Adapted from Sanford Guide to Antimicrobial Therapy, 29th edition, Hyde Park, Vt: Antimicrobial Therapy, Inc., 1999. Reprinted with permission of publisher.

Suture Removal

- Suturing's purpose is *approximation of skin edges to* allow healing
- Balance of stronger wound healing vs less scarring
- Suggested timing:
 - Eyelid 3 days
 - Neck 3-4 days
 - Face 5 days
 - Scalp 7-14 days
 - Trunk/upper extremities 7 days
 - Lower extremities 8-14 days

LET'S PRACTICE

Setting the Needle - 90° to plane of needle - 2/3 way from point

1.5 Metric

18" 45 CM BLACK / NOIR / SCHWARZ NERO / PRETO / NEGRO / 果

LOT D3E750C

on (Polyamide)

SN-1667

SURGALLOY*

🚩 19 mm

P-12 CUTTING

3/8

Exp: 2008-05

Now you got it right!!



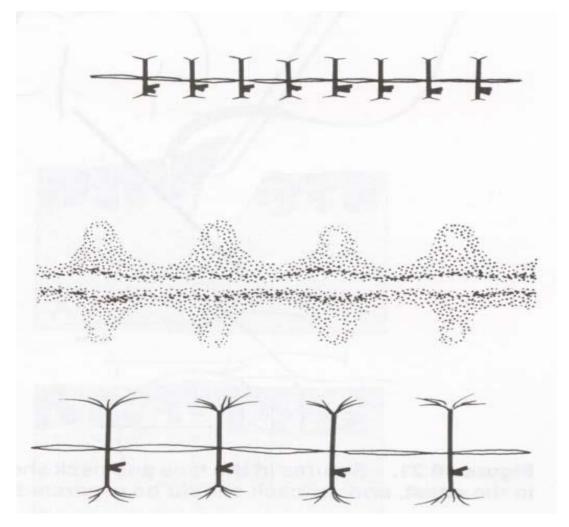
Counter-traction

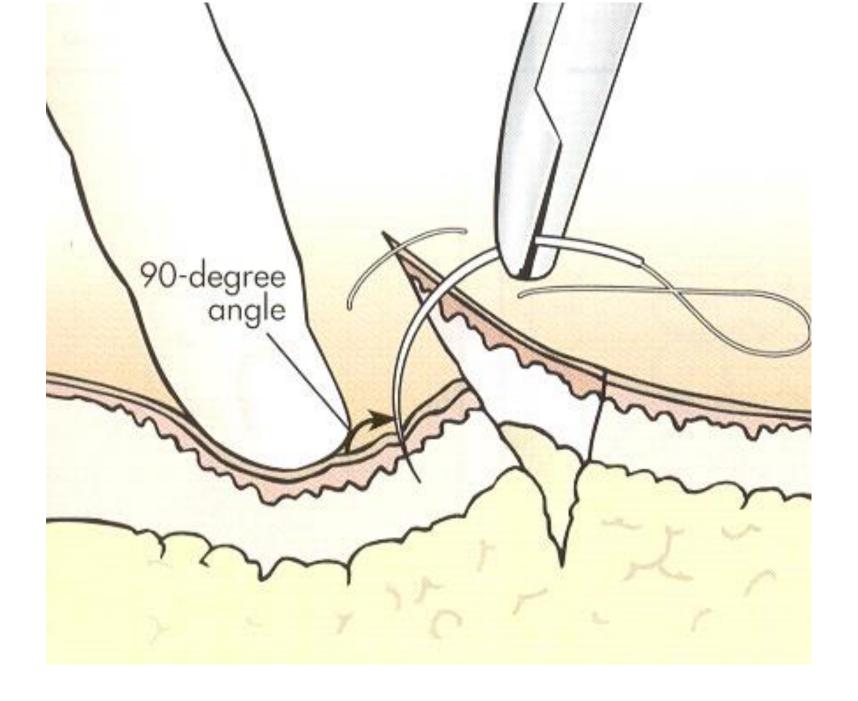
Wound Edge Eversion

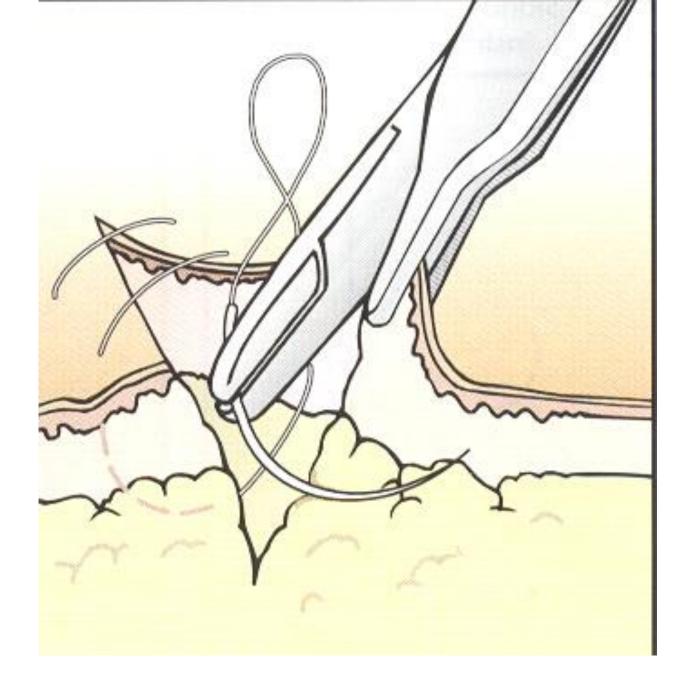
Simple Interrupted Suture

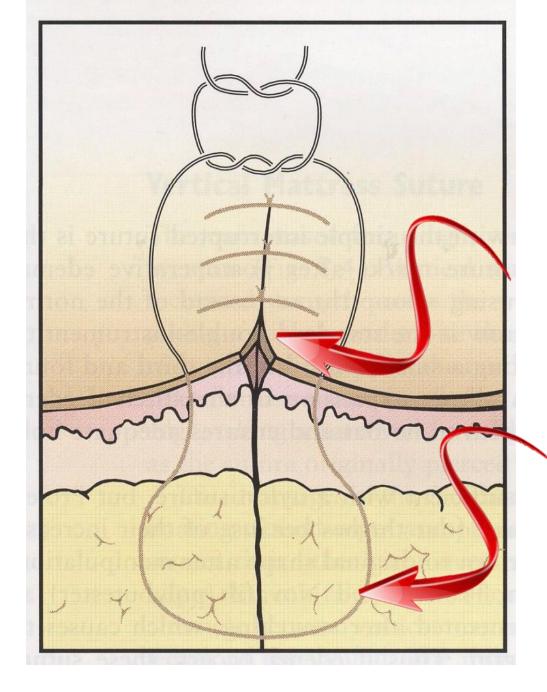
Suture Removal

- Simple
- Most common
- Universal use



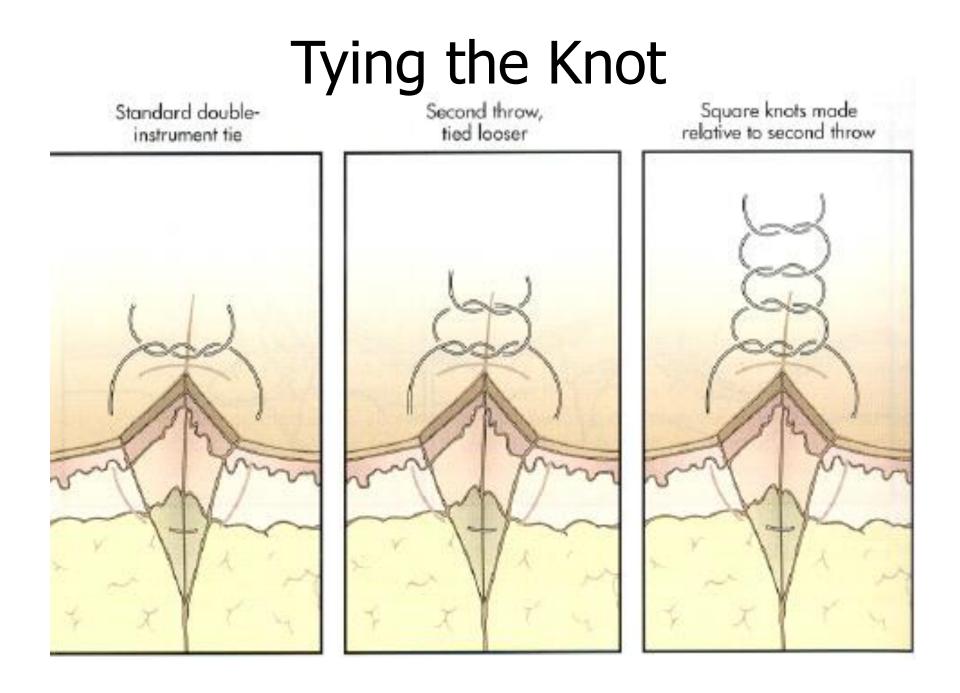




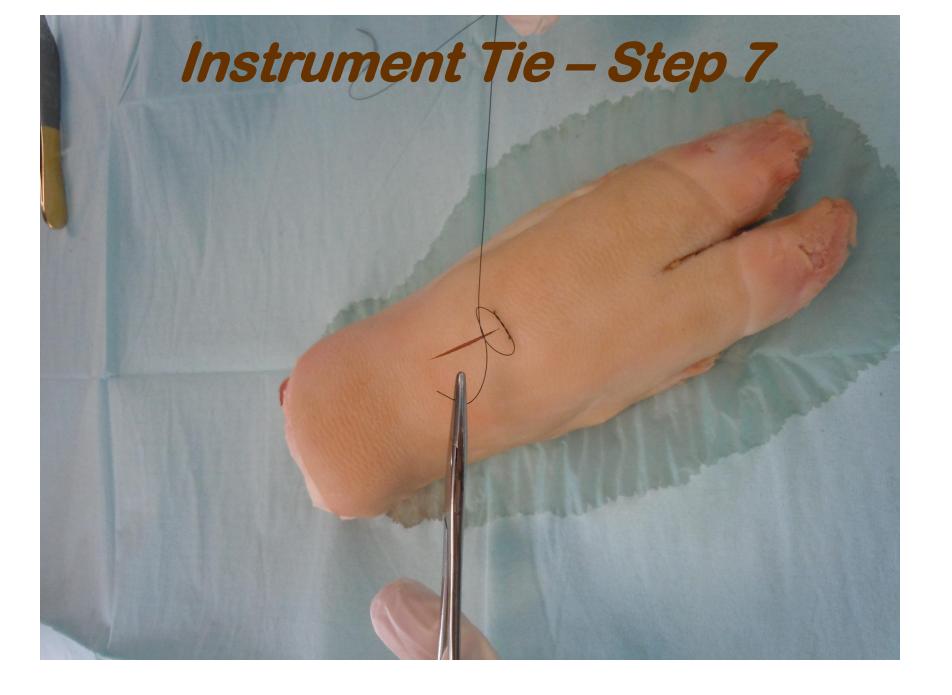


Note the wound edge eversion...

...due to the flask shaped stitch.

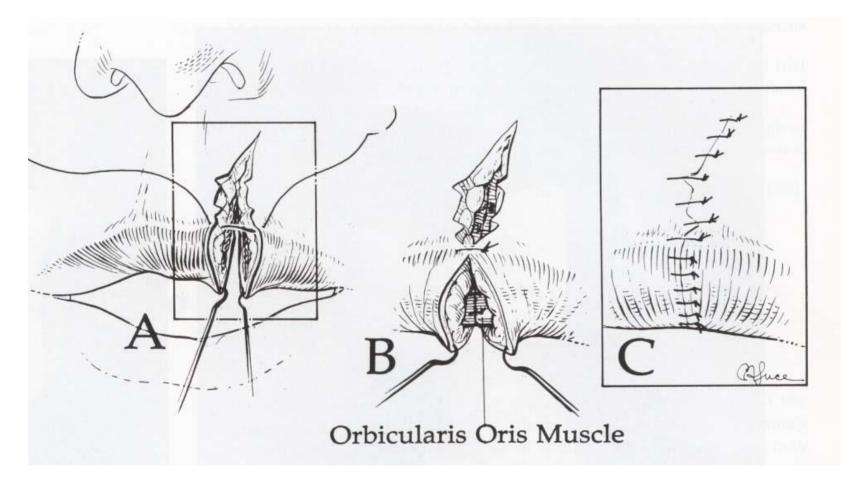






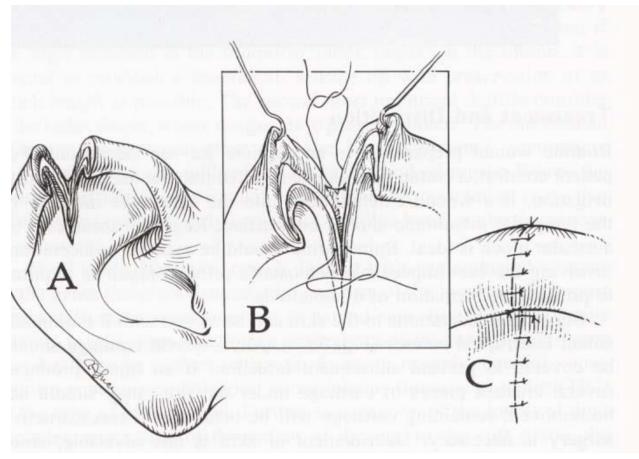


Lip Laceration



Tintinalli, 5th Edition

Ear Laceration



Tintinalli, 5th Edition

JOINTS ASPIRATIONS AND INJECTIONS

Indications

- Crystal arthropathies
- Hemarthrosis
- Symptomatic relief of a large effusion
- Joint effusion
- Monoarthritis

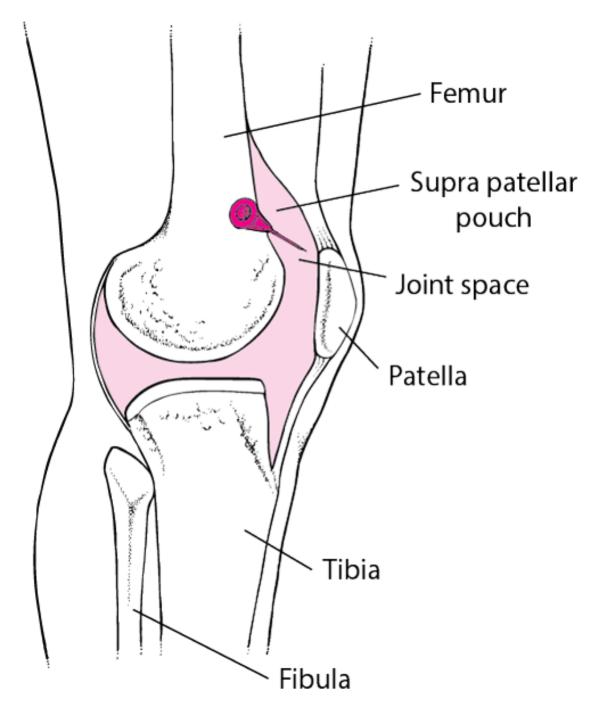
Contra-indications of intra-articular injection

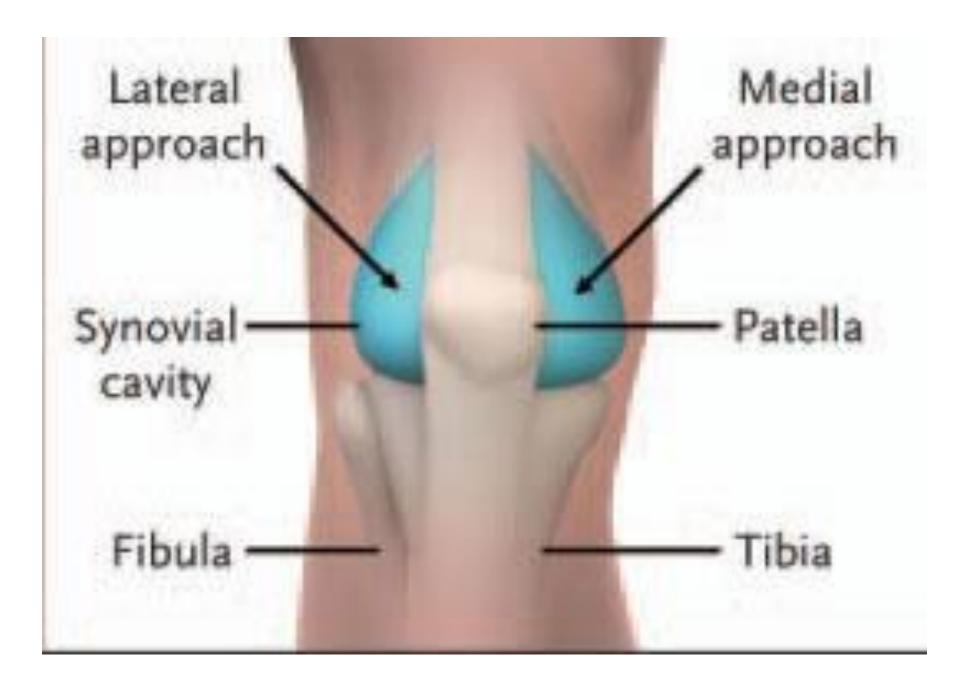
- Adjacent osteomyelitis
- Bacteremia
- Hemarthrosis
- Septic arthritis
- Joint prosthesis
- Osteochondral fracture
- Peri-articular cellulitis
- Uncontrolled bleeding disorder or anticoagulation

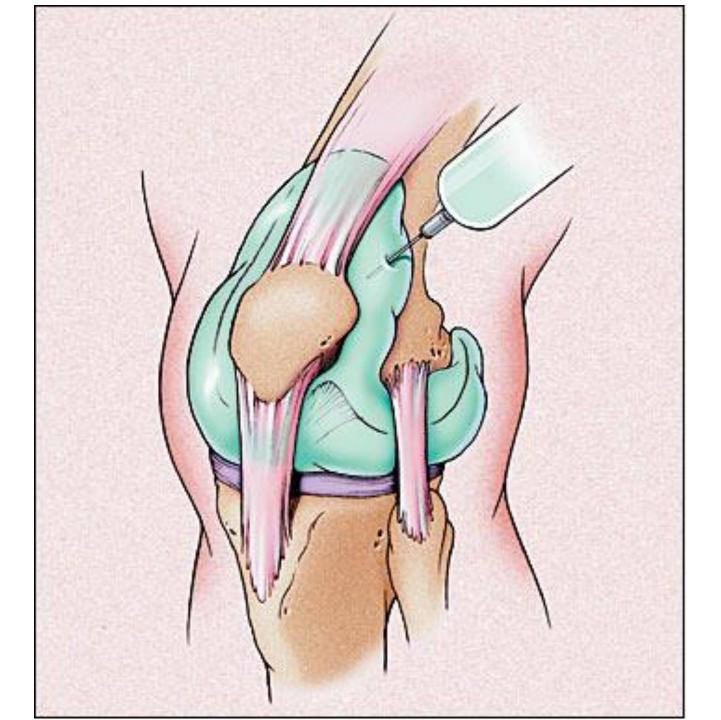
Technique

- Sterile technique
 - Disinfection with Chlorexhidine or Betadine
 - Sterile gloves
 - Sterile fenestrated drape
 - 10mL syringes x 2
 - 25G 1 ½ inch needle
- Xylocaine or Bupivacaine
- Betamethasone (Celestone) or Methylprednisolone (Depo-Medrol) 1ML in 3-5mL of Xylocaine or Bipuvacaine

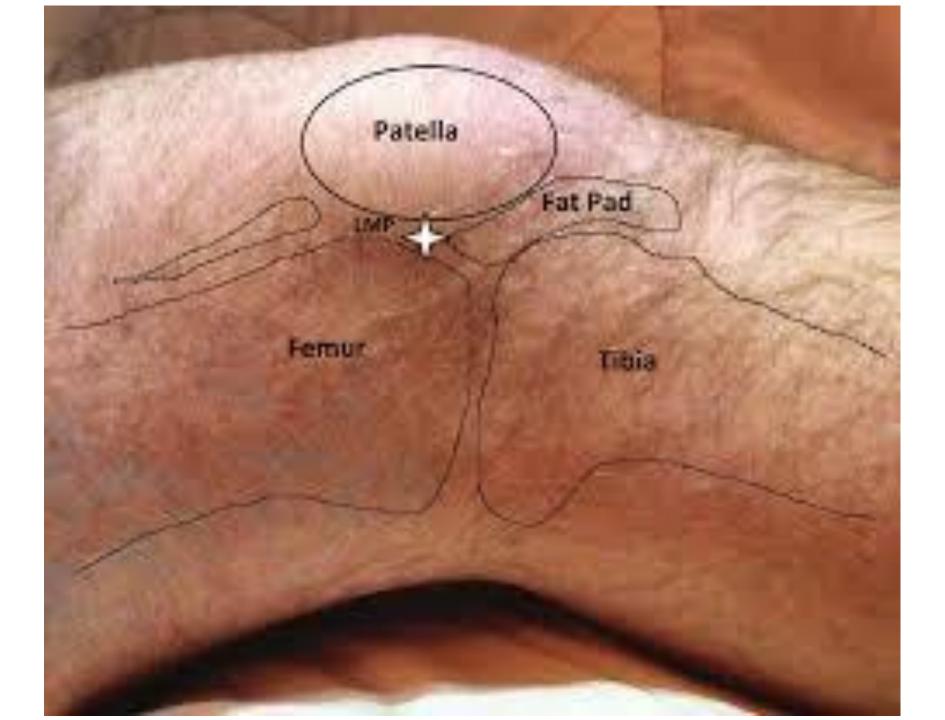
KNEE





















SHOULDER

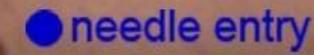
clavicle coracoid

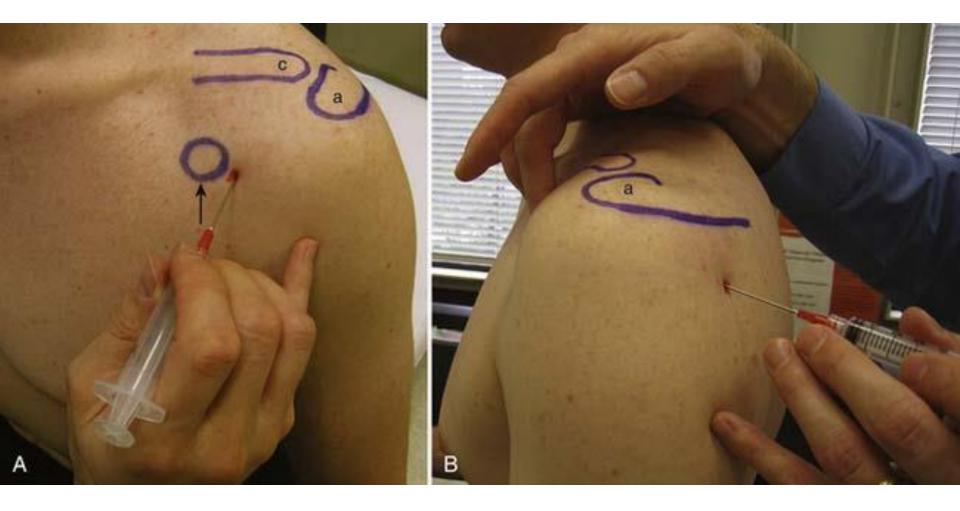
humeral head

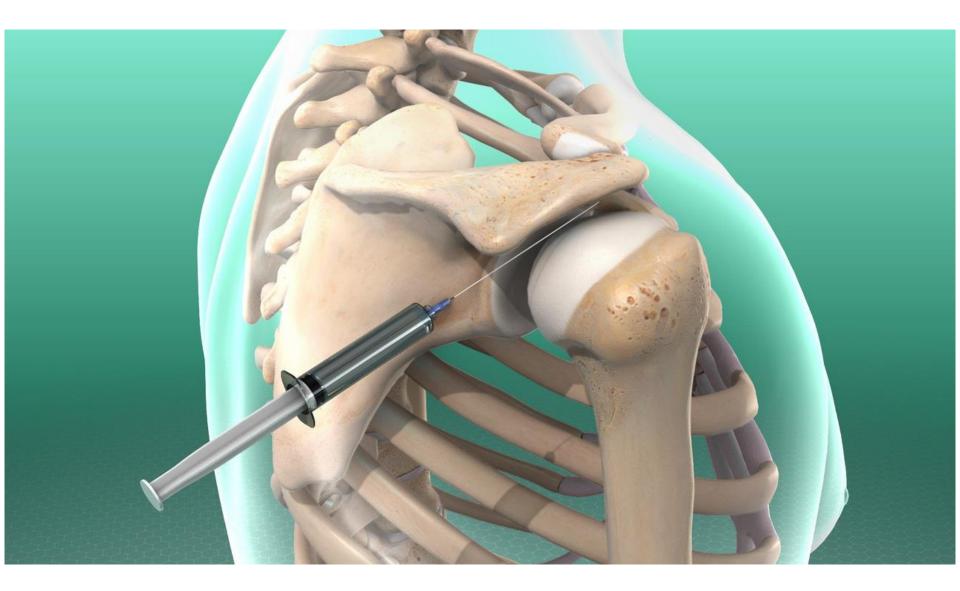
needle entry

clavicle

humeral head





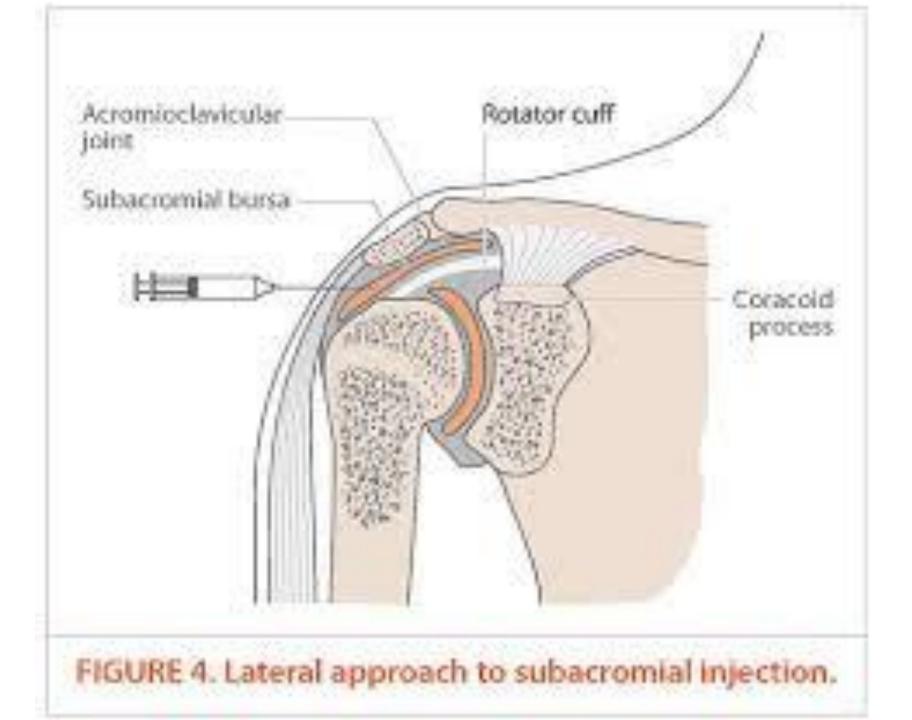




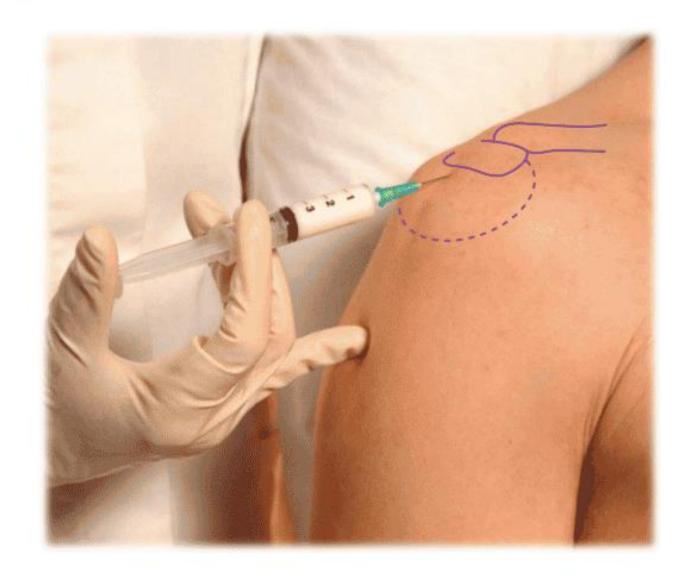
Needle aspiration

Shoulder joint

Bursa



Lateral Approach



THANK YOU