INJECTION THERAPY OF COMMON LOWER EXTREMITY MUSCULOSKELETAL PROBLEMS

James Mikulsky, PA-C.

Orthopedics & Surgery

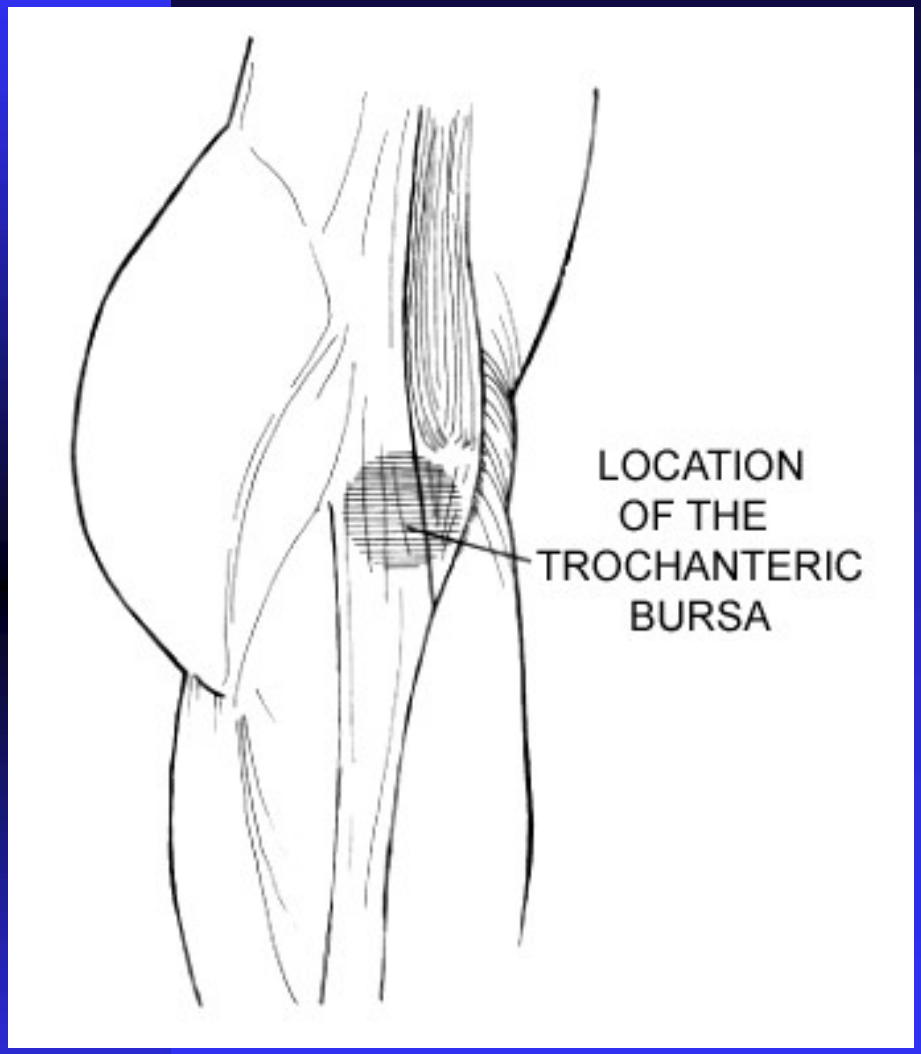
Sisters of Charity Hospital, Buffalo, NY

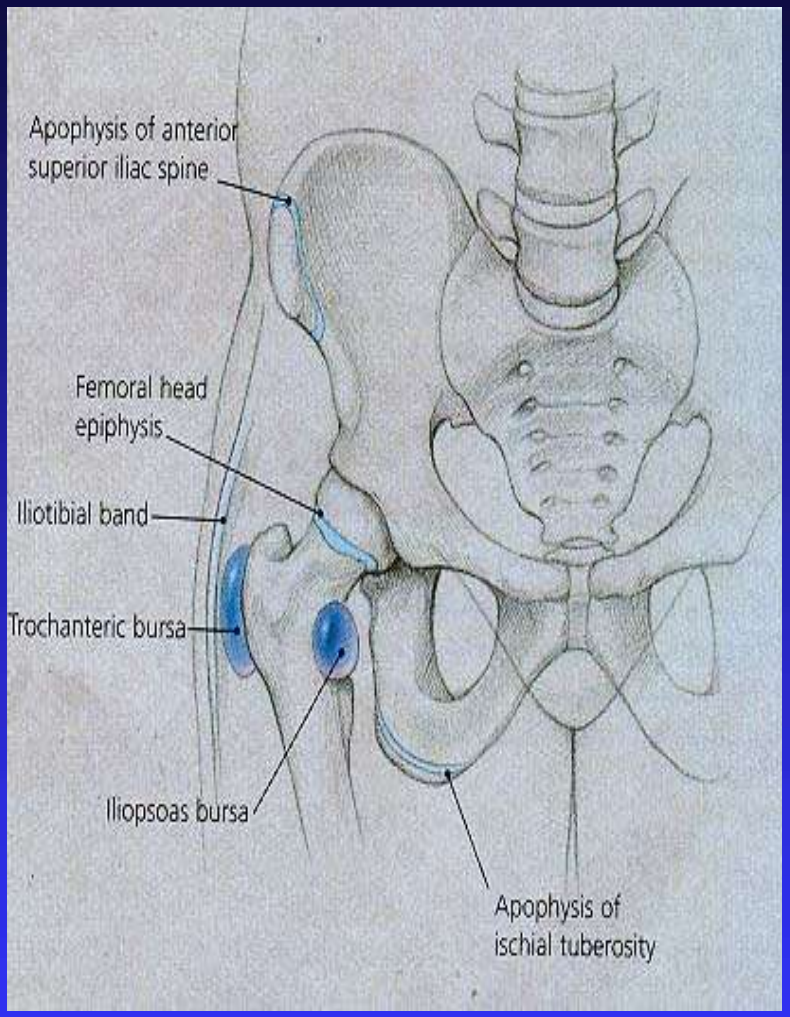
ATTITUDE

"The longer I live, the more I realize the impact of attitude on life. Attitude, to me, is more important than facts. It is more important than the past, than education, than money, than circumstances, than failures, than success, than what other people think or say or do. It is more important than appearance, than giftedness or skill. It will make or break a company...a church...a home. The remarkable thing is we have a choice everyday regarding the attitude we will embrace for that day. We cannot change our past...we cannot change the fact that people will act in a certain way. We cannot change the inevitable. The only thing we can do is play on the one string we have, and that is our ATTITUDE...I am convinced that life is 10% what happens to me and 90% how I react to it. And so it is with you... we are in charge of our ATTITUDES." Charles Swindell

TROCHANTERIC BURSITIS

- HISTORY: middle age to elderly, more female than male, gradual onset,aching pain over lateral thigh, increased with laying on affected side, walking, getting up from a sitting position
- PHYSICAL EXAM: tenderness over lateral trochanteric process/ bursa area, fairly normal R.O.M., may have pain w resisted external rotation and or resisted abduction
- XRAY- may be normal


LOCATION
OF THE
TROCHANTERIC
BURSA


Apophysis of anterior
superior iliac spine
Femoral head
epiphysis
Iliotibial band
Trochanteric bursa
Iliopsoas bursa
Apophysis of
ischial tuberosity

TROCHANTERIC BURSITIS INJECTION

PATIENT POSITION: patient laying on unaffected side w lower leg straight & affected leg flexed at hip & knee

LANDMARKS OUTLINED: trochanteric process (able to locate by internally/externally rotating femur using lower leg as a lever) point of maximum tenderness

TISSUE TO AVOID: no important neuro/vascular structures

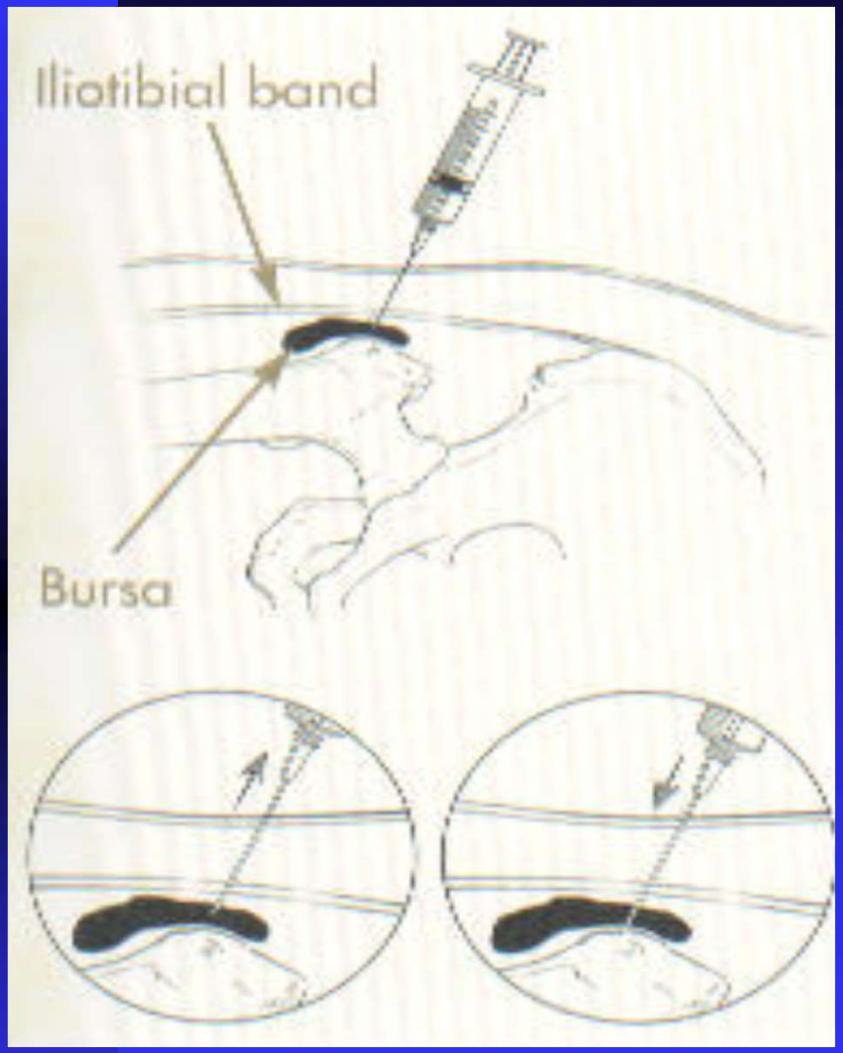
PREP- betadine, alcohol wipe, may use local anesthetic (lidocaine, ethylchloride)

NEEDLE INSERTION- insert 22-25g 11/2”-31/2’”needle thru anesthitized skin perpendicular to point of maximum tenderness, caress bone withdraw 1-3mm

DEPOSITION: inject by peppering in a quadrential process 4-6ml lido 1%, 20-40mg TAC

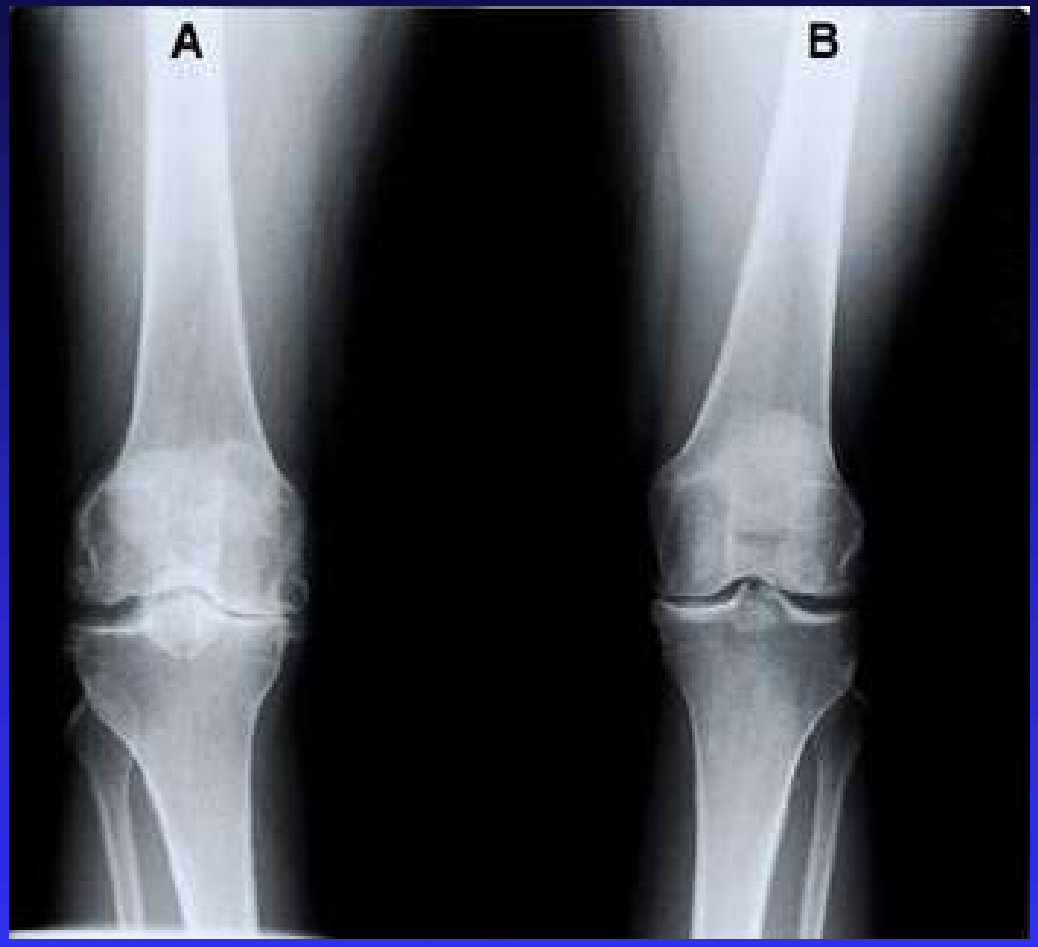
OBSERVE PATIENT- watch for vaso-vagal reaction, apply gentle “healing” massage and range of motion, re-examine for improvement of symptoms

PATIENT EDUCATION: reinforce wholisitc approach; provide post injection instructions and f/u

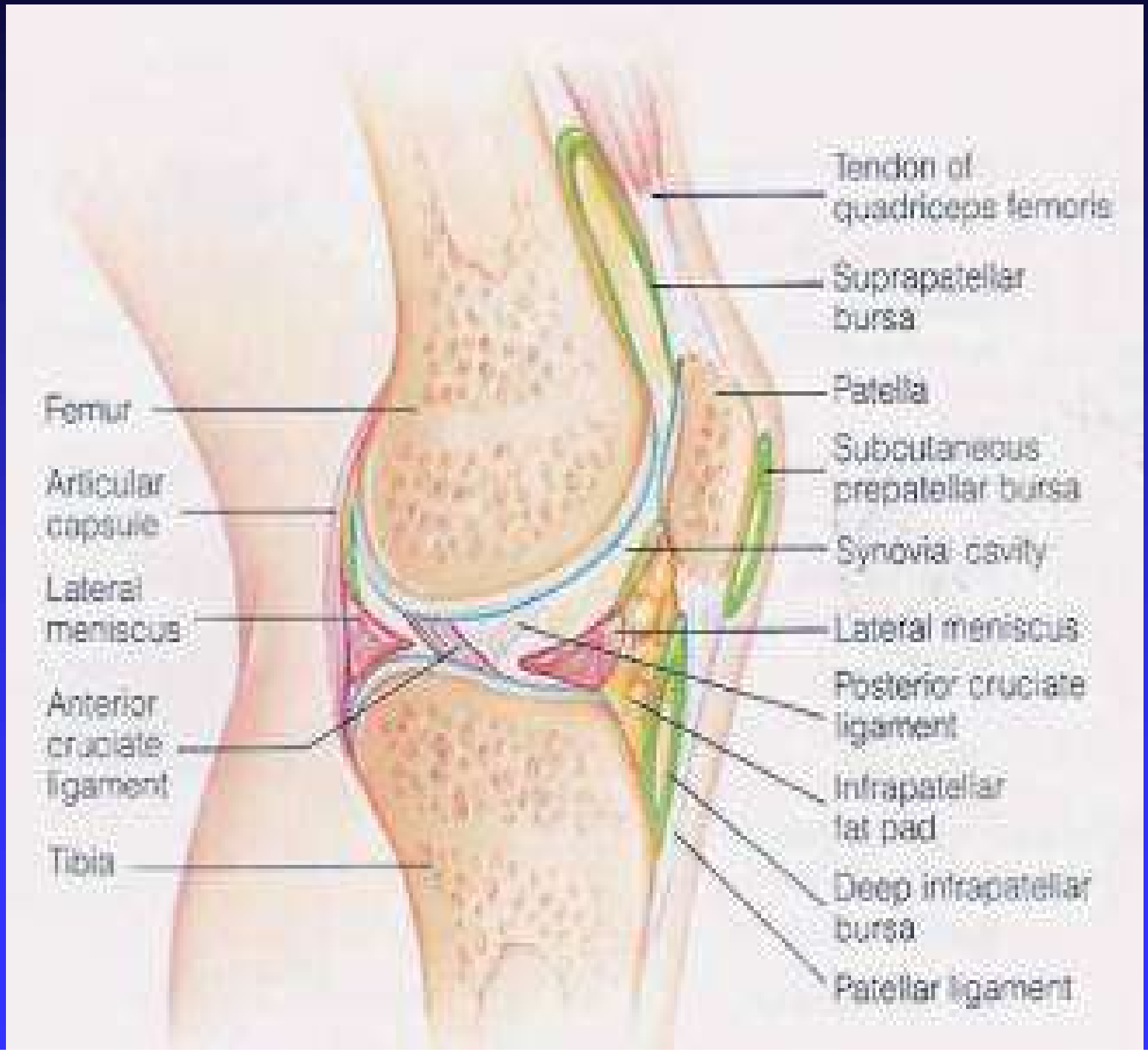

Iliotibial band
Bursa

OSTEOARTHRITIS OF THE KNEE (KNEE SYNOVITIS)

- HISTORY: age over 50, knee pain worse w movement prolonged standing and or walking, stiffness less than 30 minutes in the morning
- PHYSICAL EXAM: may have bony enlargement,may have swelling, not warm,bony pain, crepitus
- XRAY- joint space narrowing, sclerosis, cysts, osteophytes


A
B

MEDIAL VIEW OF KNEE



KNEE JOINT ASPIRATION & INJECTION TECHNIQUE FOR PATIENT WITH A KNEE EFFUSION

PATIENT POSITION: patient laying supine with knee straight or slightly bent, small towel under knee

LANDMARKS OUTLINED: superior pole of patella; underside superior pole (lateral aspect) of the patella; mark spot

TISSUE TO AVOID: bone, no important neuro/vascular structures

PREP- betadine, alcohol wipe, local anesthetic (lidocaine, ethylchloride)

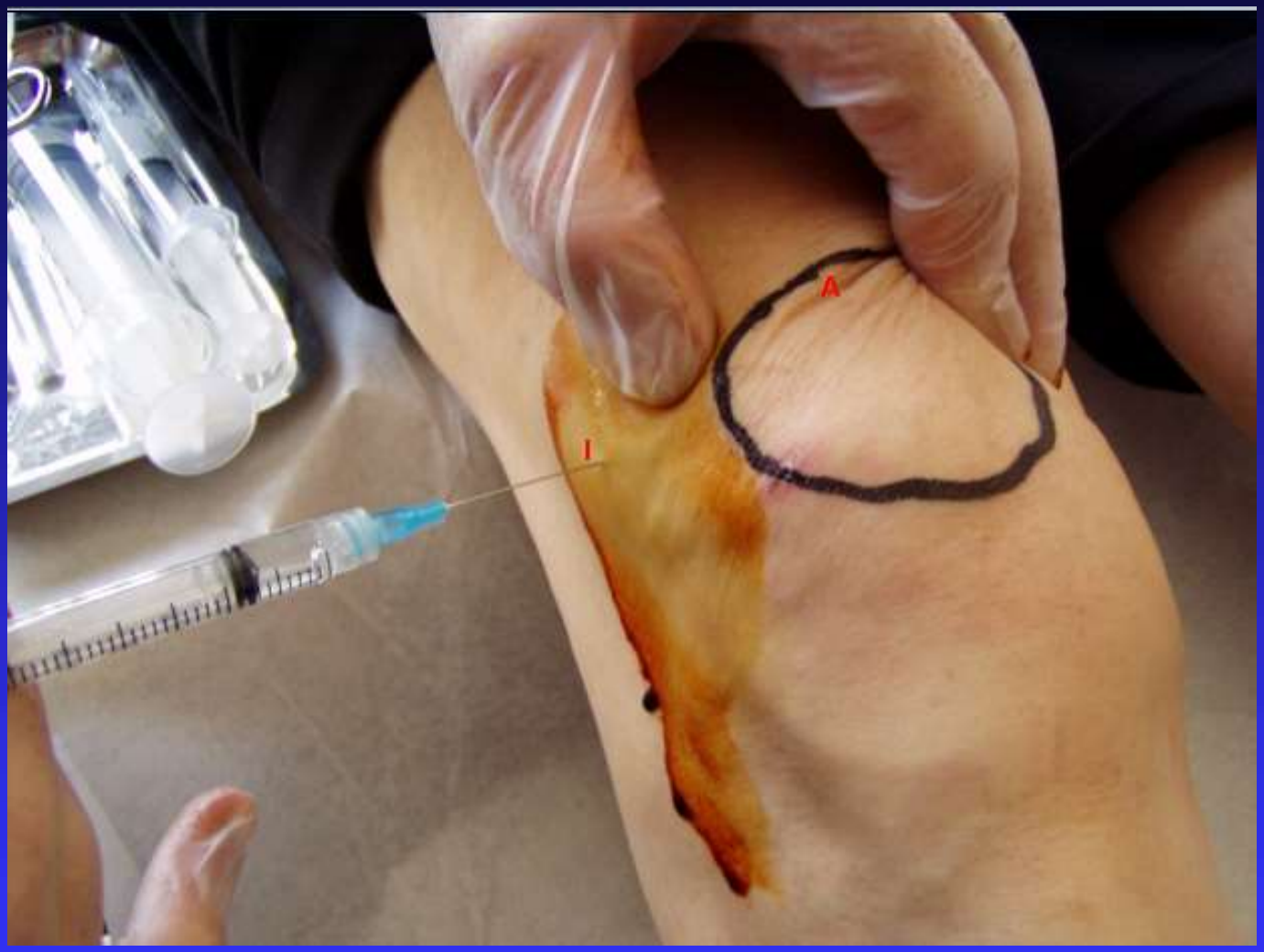
NEEDLE INSERTION- insert 19g. 11/2" needle thru anesthetized skin at the underside of the superior pole of the patella angling the needle horizontally, to its hub, aspirate and examine fluid. if appropriate change syringes and inject agent by bolus

OBSERVE PATIENT- watch for vaso-vagal reaction, apply gentle massage and range of motion

PATIENT EDUCATION: provide post injection instructions and f/u

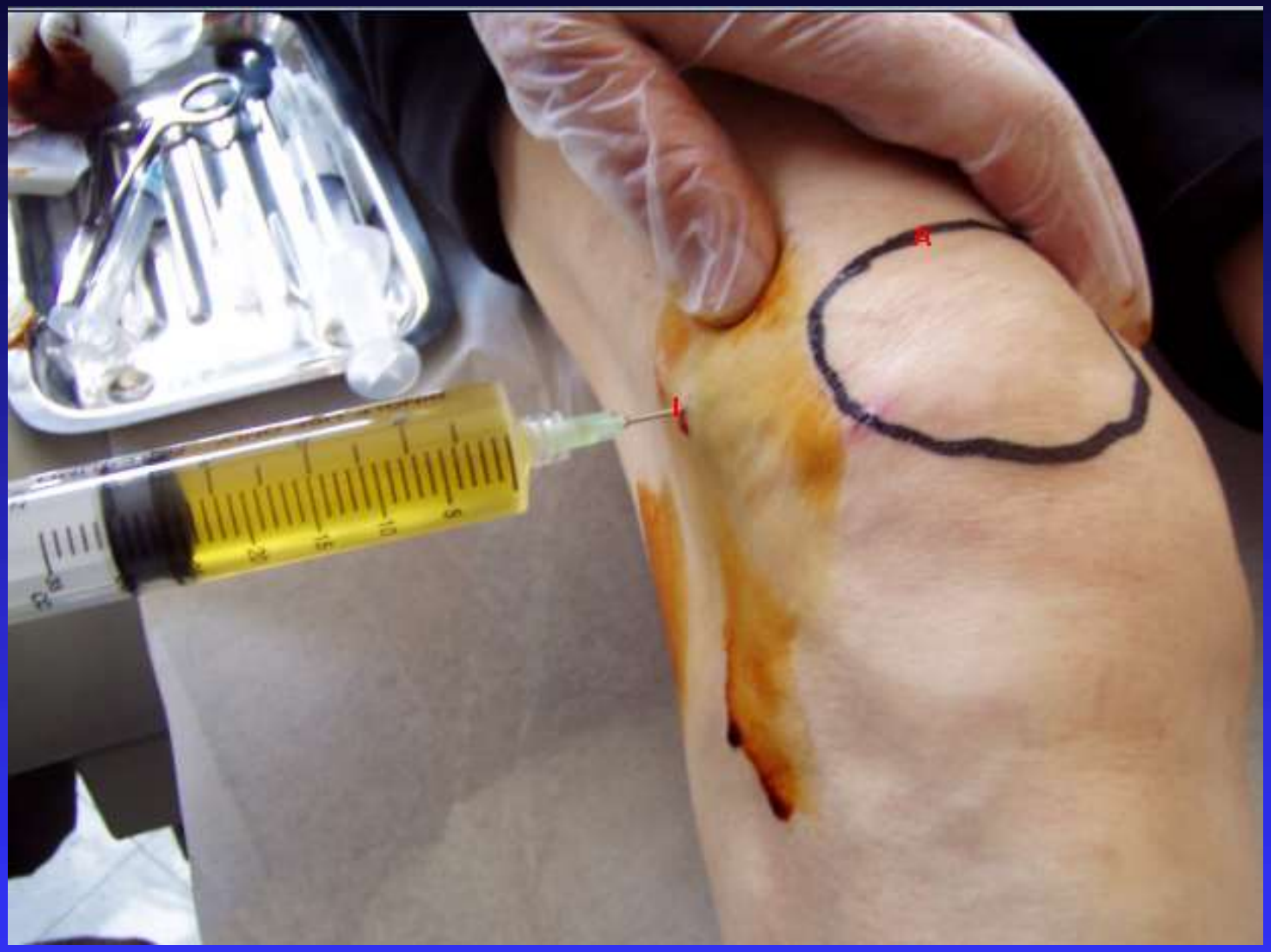
SURFACE ANATOMY WITH KNEE IN EXTENSION

KNEE JOINT ASPIRATION & INJECTION
TECHNIQUE: LOCAL ANESTHETIC INJECTED



PATIENT POSITION: patient laying supine with knee straight or slightly bent
LANDMARKS OUTLINED: superior pole of patella; underside patella ;mark spot
TISSUE TO AVOID: bone, no important neuro/vascular structures
PREP- betadine, alcohol wipe, local anesthetic (lidocaine, ethylchloride)

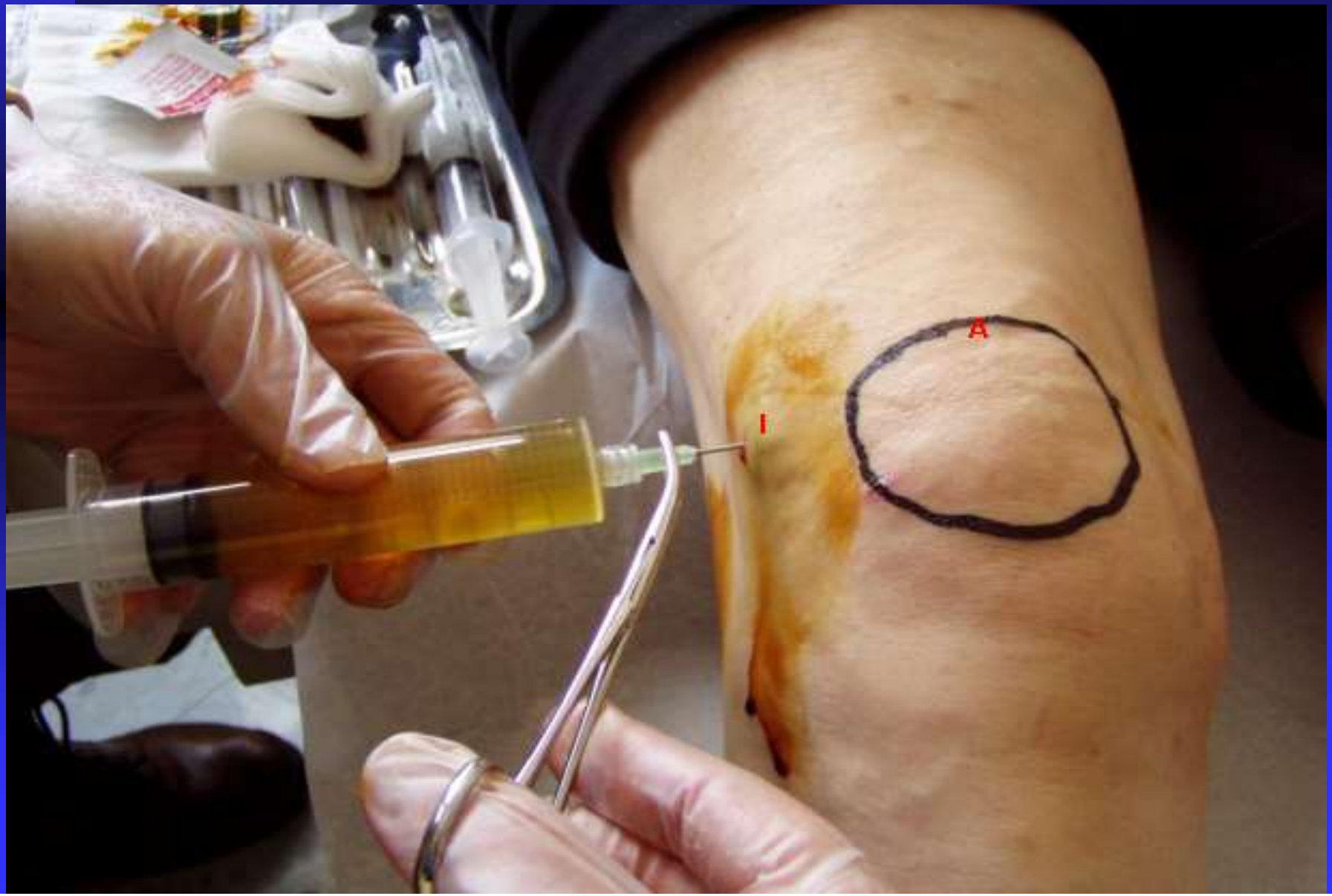
KNEE JOINT ASPIRATION & INJECTION TECHNIQUE CLEAR YELLOW JOINT FLUID IS ASPIRATED



NEEDLE INSERTION- thru anesthetized skin at the underside of the superior pole (lateral aspect) of the patella insert 19g. 11/2" needle with 35cc syringe; angling the needle horizontally, to its hub, aspirate and examine fluid.

KNEE JOINT ASPIRATION & INJECTION TECHNIQUE

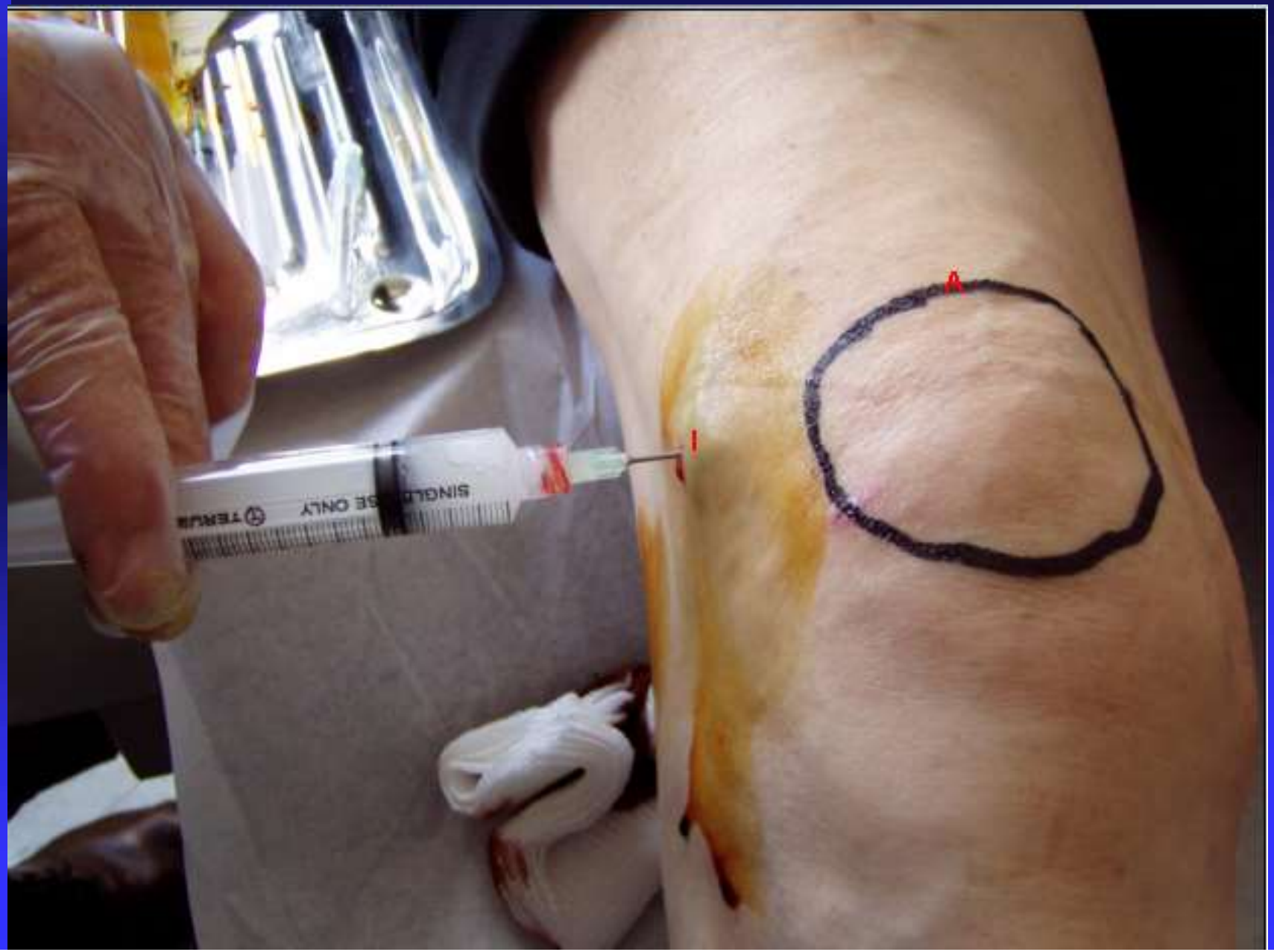
SINCE JOINT FLUID IS CLEAR YELLOW
NEEDLE HUB IS HELD BY HEMOSTAT TO ALLOW FOR CHANGING OF SYRINGES



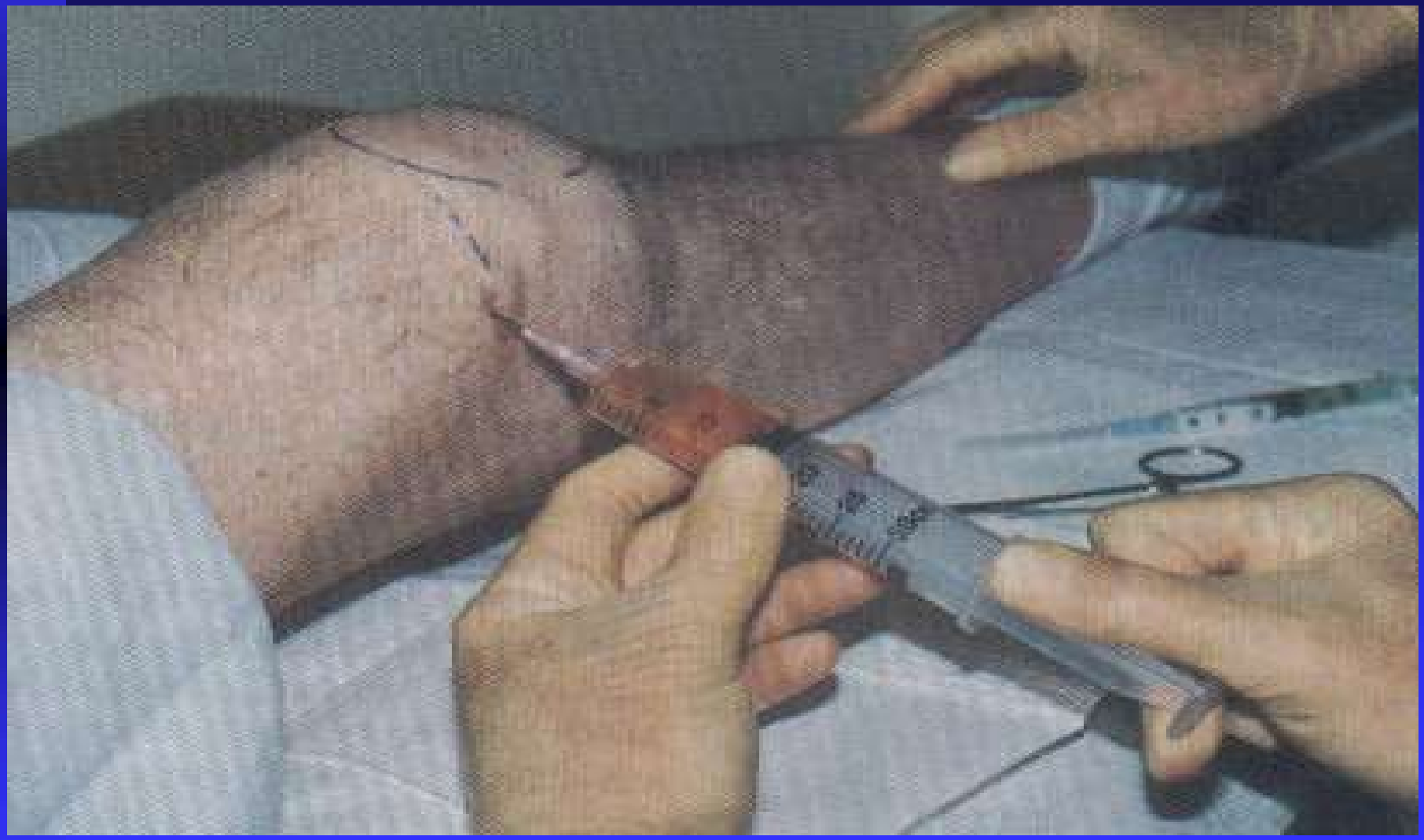
KNEE JOINT ASPIRATION & INJECTION TECHNIQUE

AFTER HAVING HAD CHANGED SYRINGES

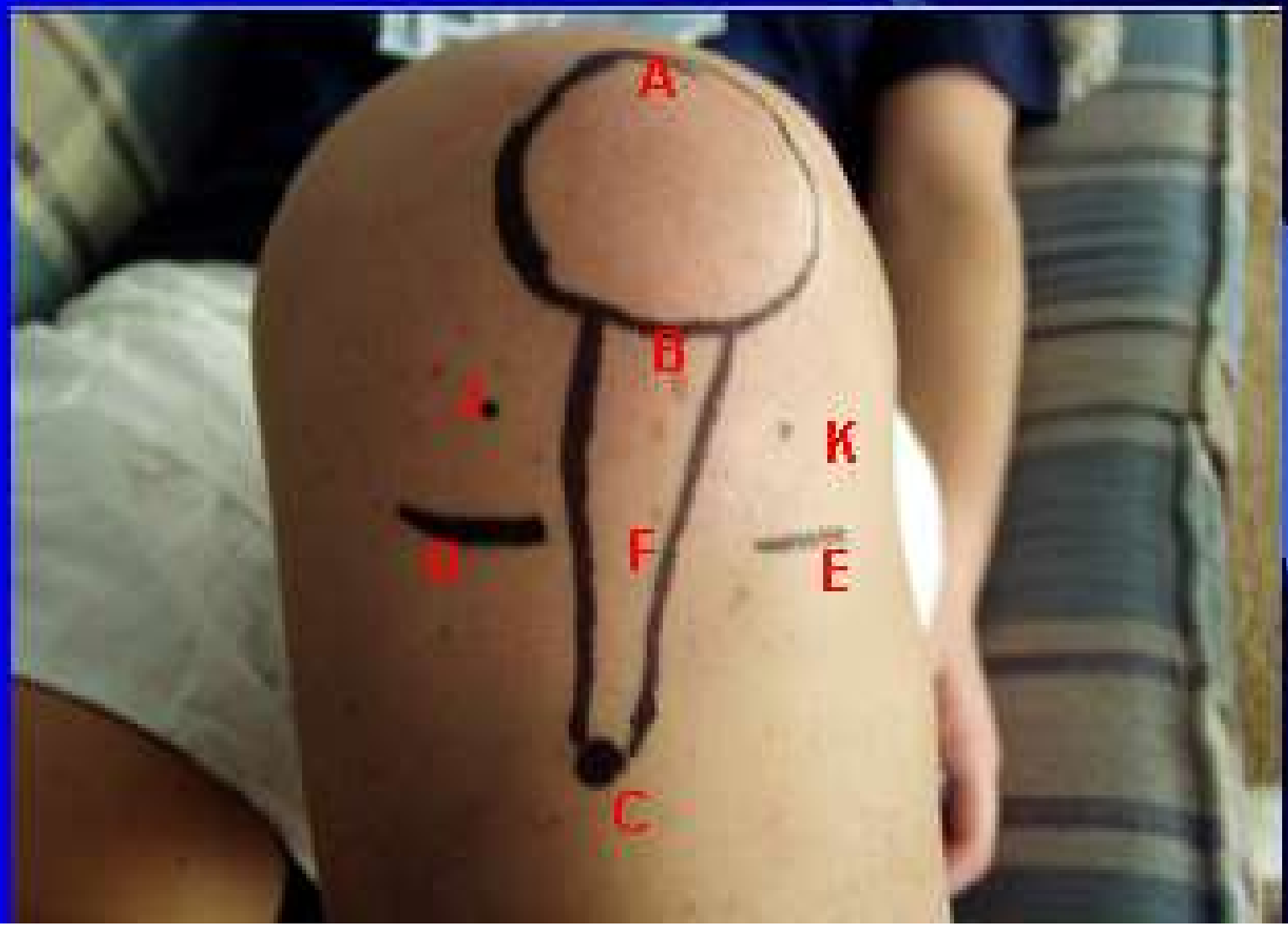
NOW INJECTING STEROID MIXTURE- bolus



SUPERIOR LATERAL KNEE ASPIRATION



SURFACE ANATOMY WITH LEFT KNEE IN 90 DEGREES FLEXION



INJECTION TECHNIQUE FOR KNEE WITHOUT EFFUSION

PATIENT POSITION: patient laying supine with knee bent at 90 degrees or patient sitting with knee hanging over table bent at 90 degrees

LANDMARKS OUTLINED: inferior pole of patella; patellar tendon; medial or lateral tibial plateau, mark spot

TISSUE TO AVOID: bone; patellar tendon; no important neuro/vascular tissues

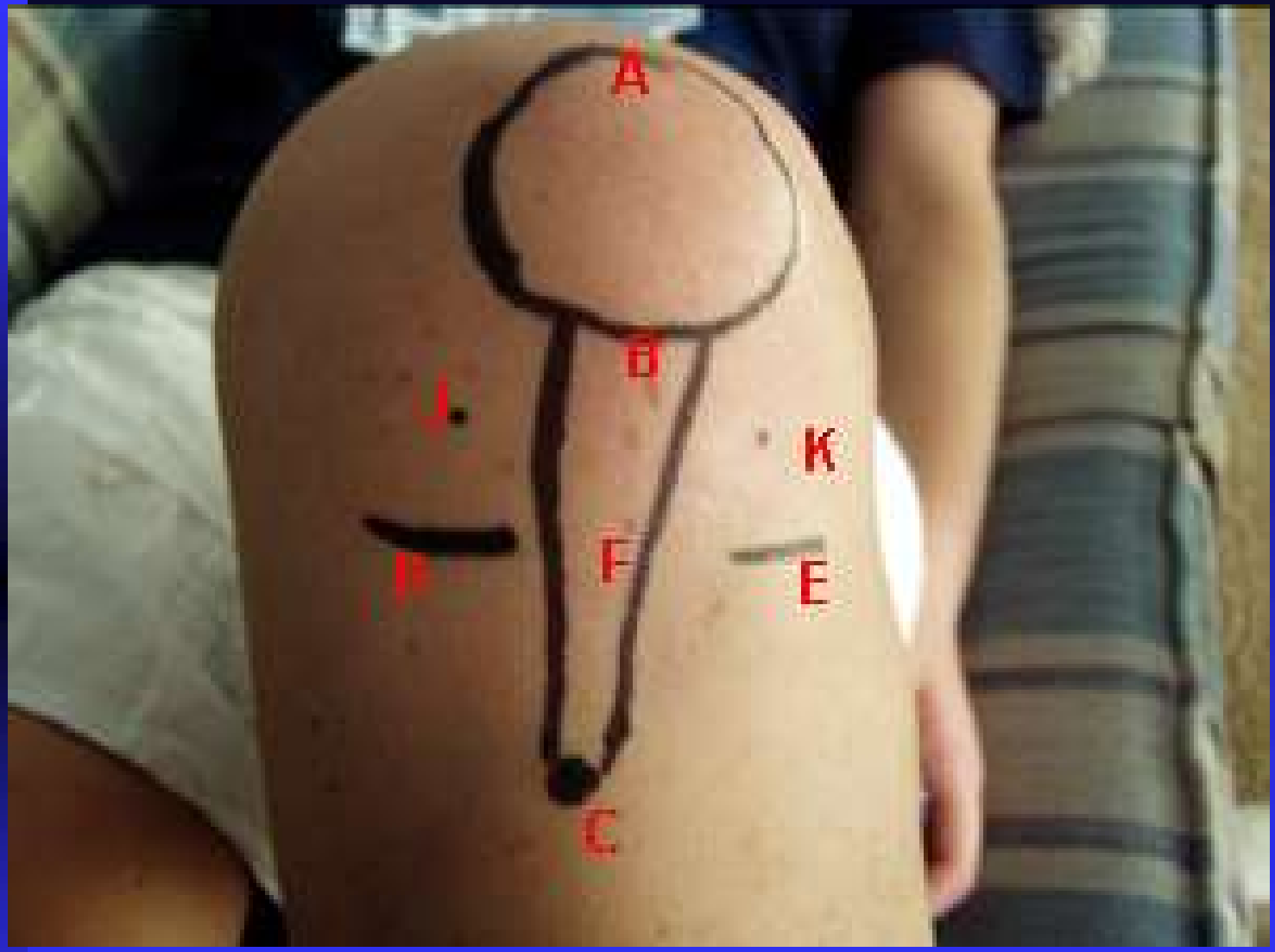
PREP: betadine, alcohol wipe, local anesthetic (lidocaine, ethylchloride)-optional

NEEDLE INSERTION: insert 22g. 11/2-2" needle thru (anesthetized) skin on either side of patellar tendon at the level of 1 finger breath above the medial or lateral tibial plateau angling the needle toward the middle of knee joint to its hub; aspirate and examine fluid if present.
if appropriate inject agent by bolus

OBSERVE PATIENT: watch for vaso-vagal reaction, apply gentle massage and range of motion

PATIENT EDUCATION: provide post injection instructions and f/u

KNEE INJECTION TECHNIQUE WITHOUT EFFUSION



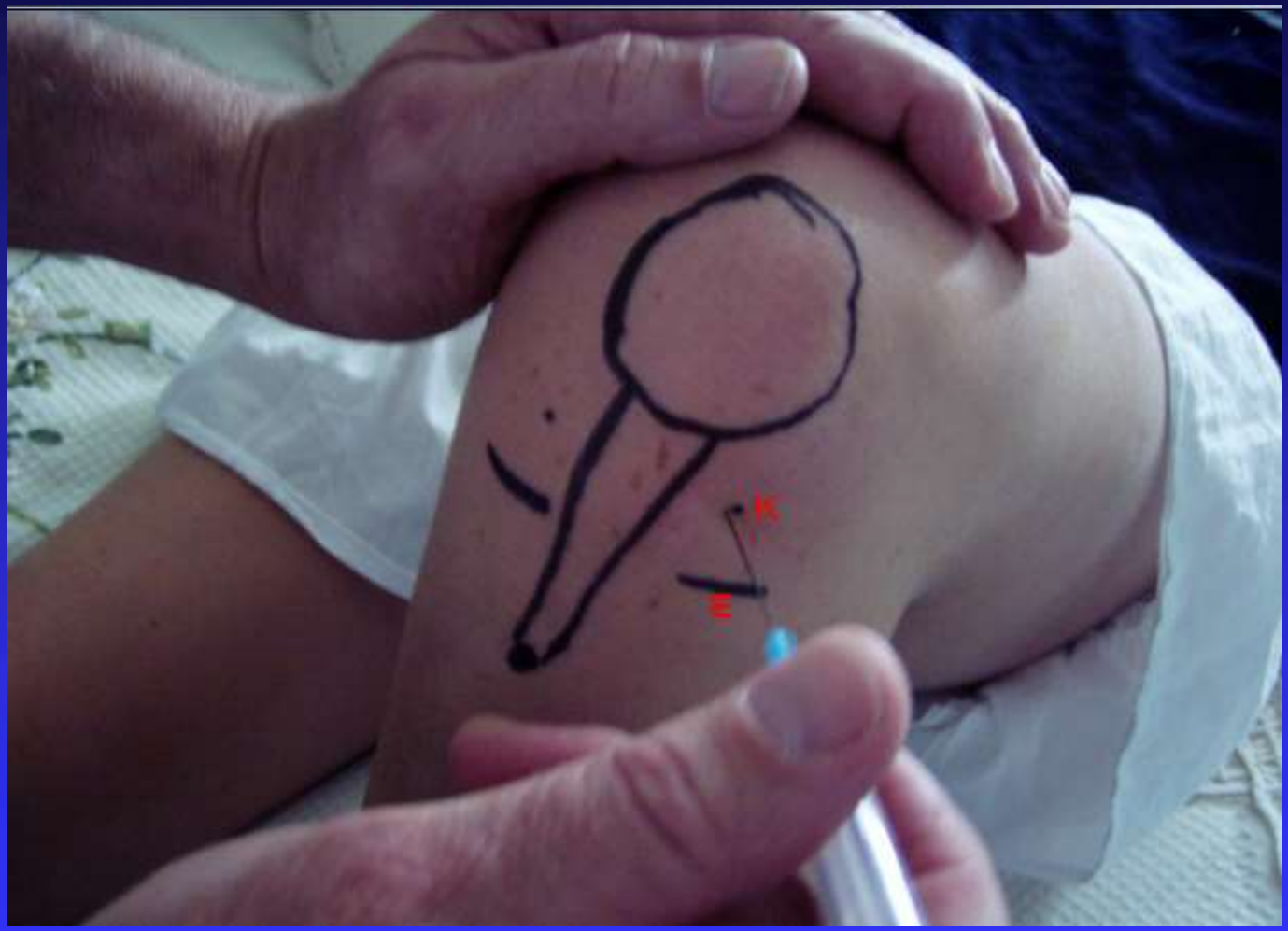
PATIENT POSITION: patient laying supine with knee bent at 90 degrees OR patient sitting with knee hanging over table bent at 90 degrees

LANDMARKS OUTLINED: patellar tendon; medial or lateral tibial plateau, 1 finger breath above plateau mark spot

TISSUE TO AVOID: bone, no important neuro/vascular structures

KNEE INJECTION TECHNIQUE WITHOUT EFFUSION

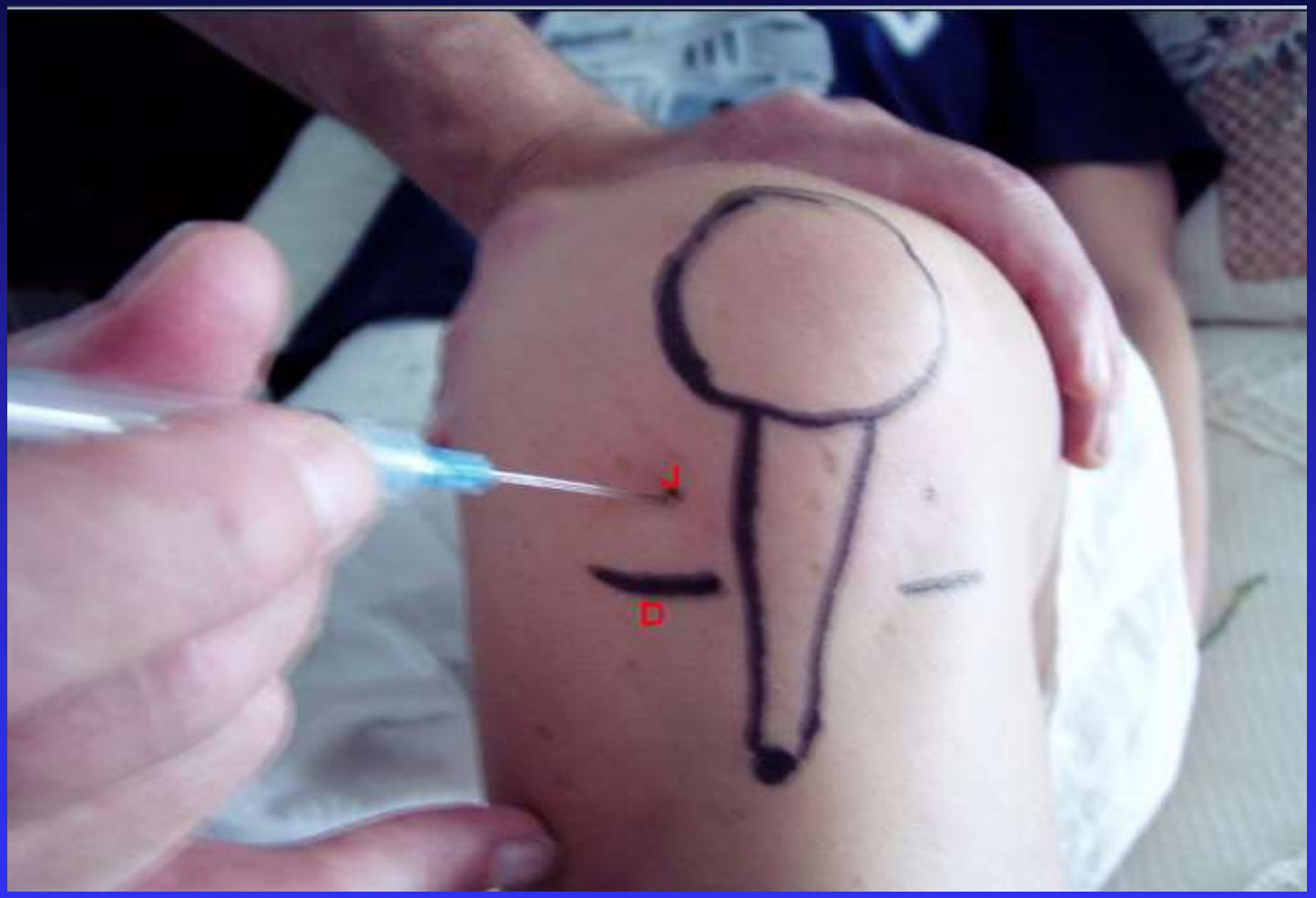
ANTEROLATERAL APPROACH WITH KNEE IN 90 DEGREES FLEXION



NEEDLE INSERTION: insert 22g. 11/2-2” needle thru (anesthetized) skin on lateral side of patellar tendon one finger breath above the lateral tibial plateau angling the needle toward the middle of knee joint to its hub; aspirate; deposit 2cc of viscosupplement in bolus; should have minimal resistance, minimal pain

KNEE INJECTION TECHNIQUE WITHOUT EFFUSION

ANTEROMEDIAL APPROACH WITH KNEE IN 90 DEGREES FLEXION



NEEDLE INSERTION: insert 22g. 11/2-2” needle thru (anesthetized) skin on medial side of patellar tendon one finger breath above the medial tibial plateau angling the needle toward the middle of knee joint to its hub; aspirate; deposit 2cc of viscosupplement in bolus; should have minimal resistance, minimal pain

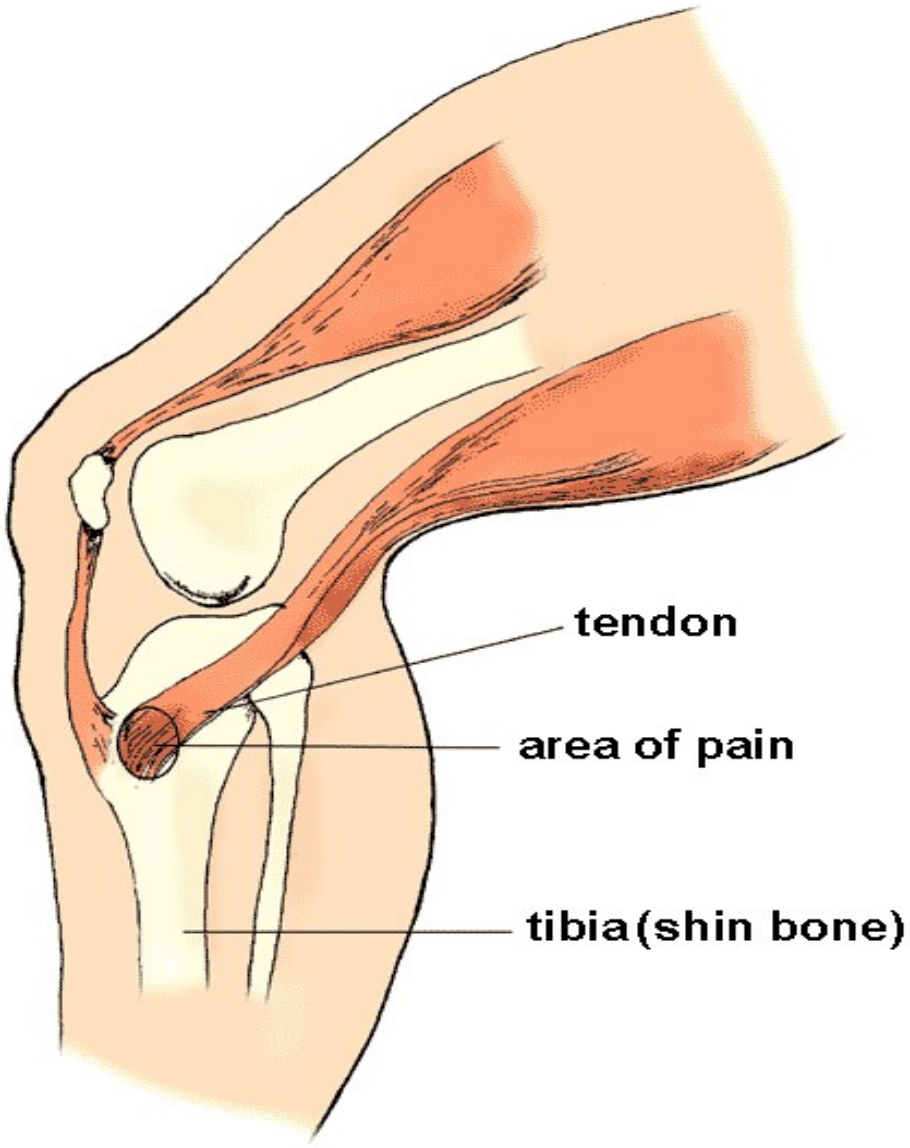
PES ANSERINE BURSITIS

- HISTORY: middle age to elderly, more female than male, overweight, with big legs and pear shape, often oa of the knee, pain located inner & lower aspect of knee, pain worse w going up & down stairs

- PHYSICAL EXAM: knee bulky, exquisitely tender to palpation at site of pes anserine bursa, knee R.O.M. usually not affected

- XRAY- may be normal, may show oa changes

Pes Anserine Bursitis



PES ANSERINE BURSITIS INJECTION TECHNIQUE

PATIENT POSITION: ptn laying supine with knee bent at 90 degrees
ptn sitting with knee hanging over table bent at 90 degrees

LANDMARKS OUTLINED: point of maximum tenderness located approximately 2” below medail joint line and medial to tibial tubercle

TISSUE TO AVOID: no important neuro/vascular structures

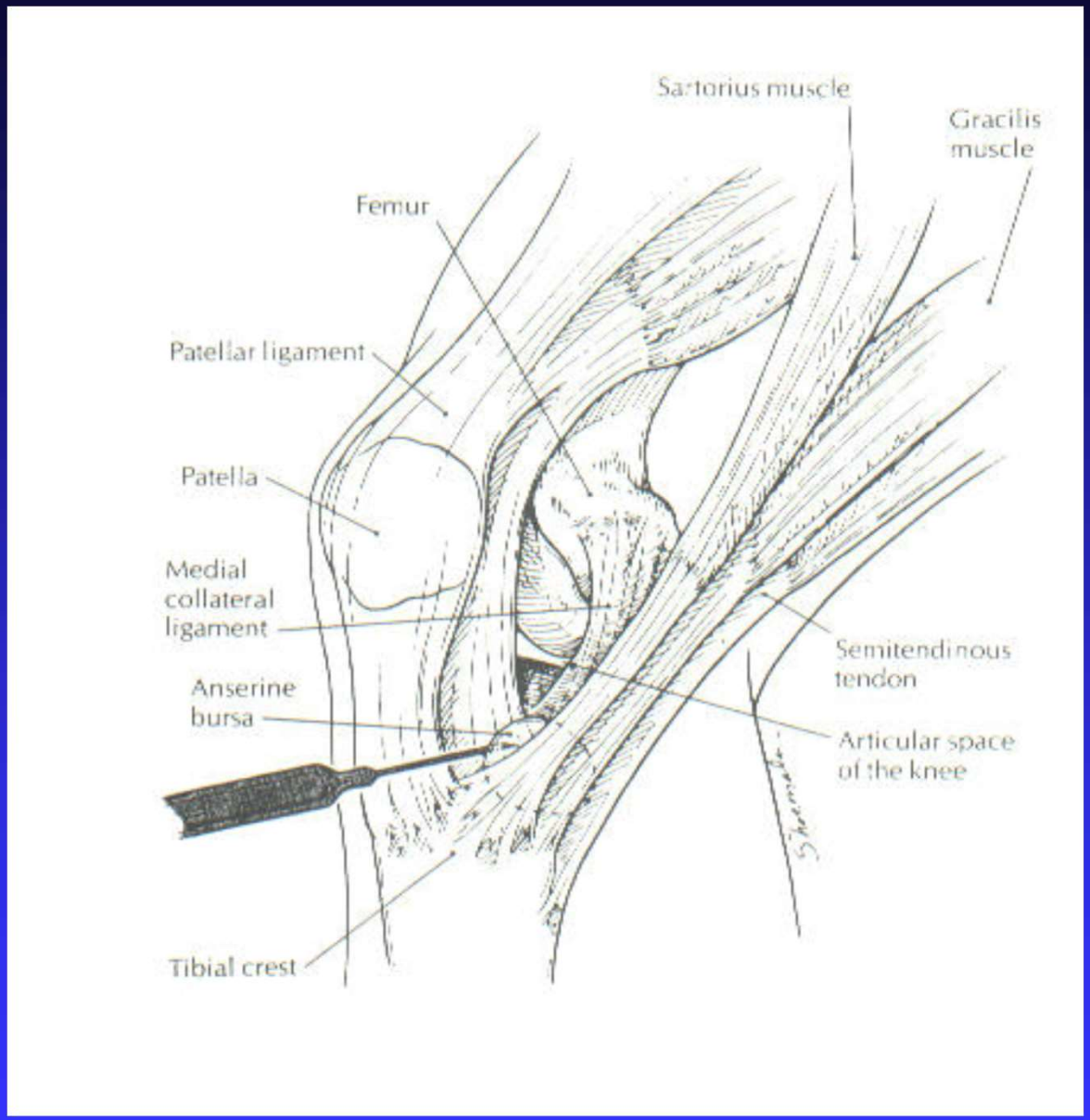
PREP: betadine, alcohol wipe, may use local anesthetic (lidocaine, ethylchloride)

NEEDLE INSERTION: insert 22-25g 11/2-2”needle thru anesthtized skin perpendicular to point of maximum tenderness, caress bone withdraw 2-3 mm

DEPOSITION: aspirate,inject by peppering in a quadrential process 4-6ml lido 1%, 20-40mg TAC

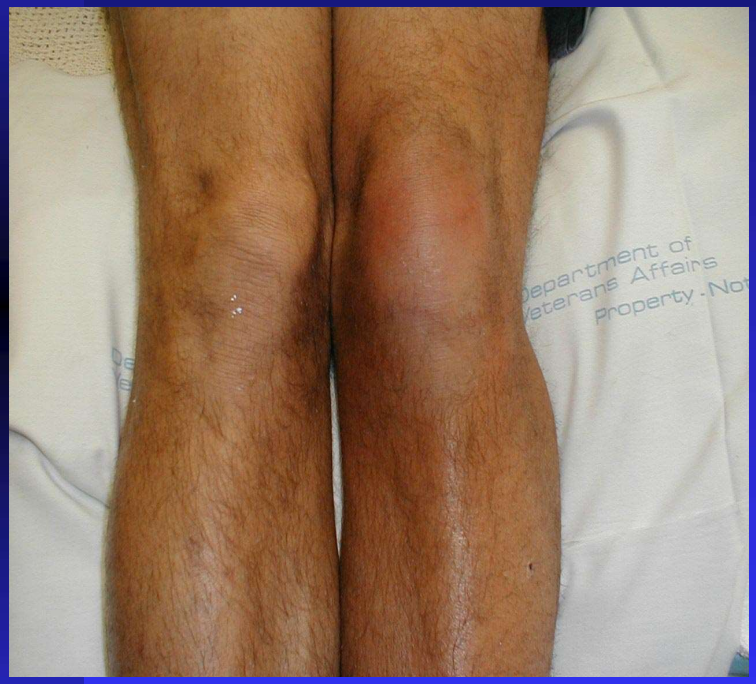
OBSERVE PATIENT: watch for vaso-vagal reaction, apply gentle “healing” massage and range of motion, re-examine for improvement of symptoms

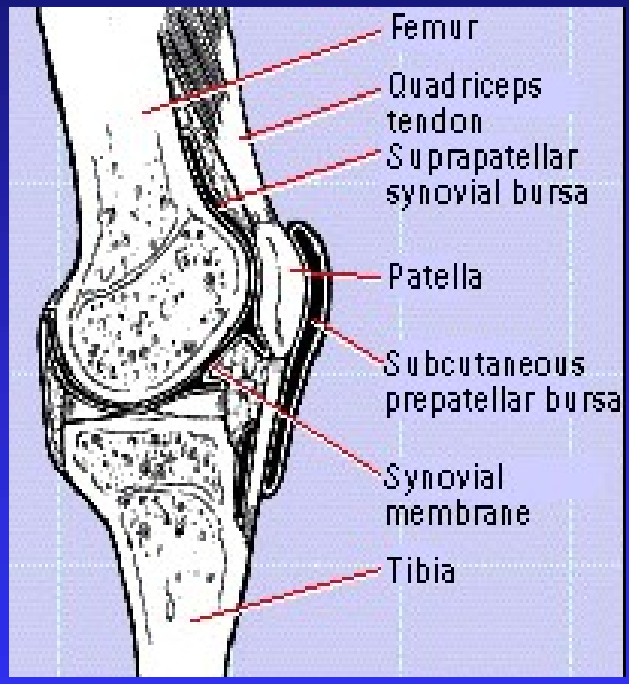
PATIENT EDUCATION: reinforce wholisitic approach,provide post injection instructions and f/u


Sartorius muscle
Gracilis muscle
Femur
Patellar ligament
Patella
Medial collateral ligament
Anserine bursa
Semitendinous tendon
Articular space of the knee
Tibial crest

PRE PATELLAR BURSITIS (HOUSEMAID'S KNEE)

- HISTORY: excessive kneeling, leaning forward on knees, pain, swelling located above patella
- PHYSICAL EXAM: swollen, fluctuant cystic mass located above patella, may be red, hot, tender
- XRAY- may be normal

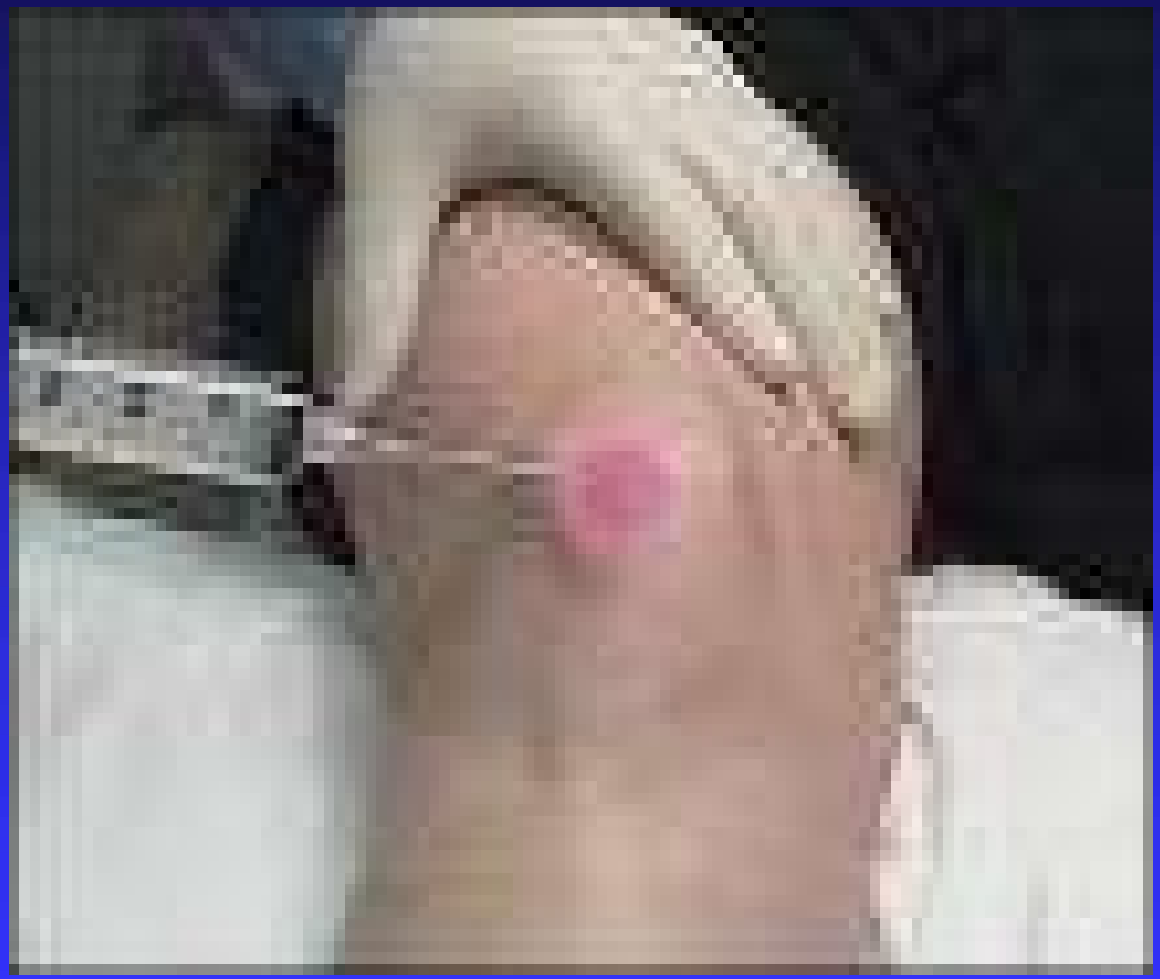

Department of
Veterans Affairs
Property .No


Femur
Quadriceps tendon
Suprapatellar synovial bursa
Patella
Subcutaneous prepatellar bursa
Synovial membrane
Tibia

PRE PATELLAR BURSITIS (HOUSEMAID'S KNEE) ASPIRATION & INJECTION

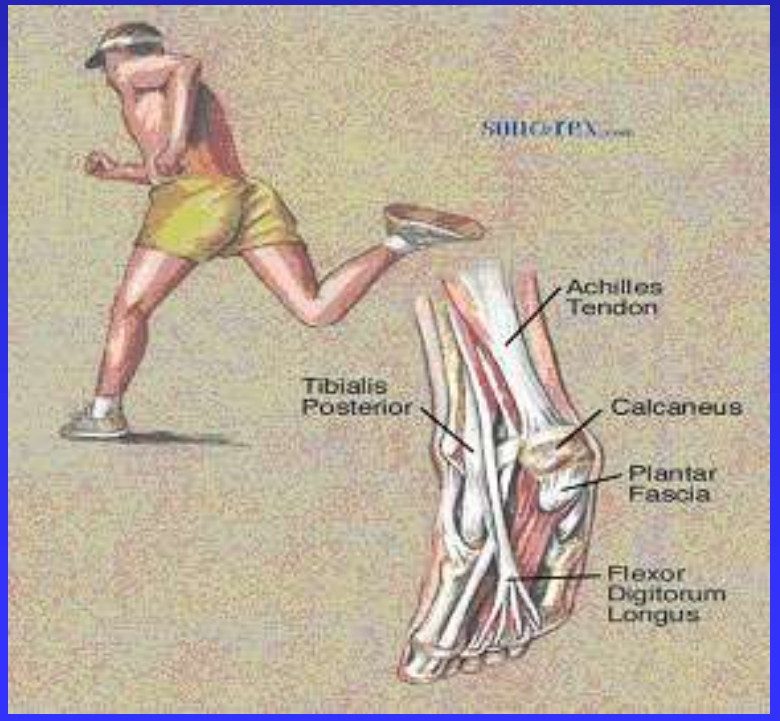
PATIENT POSITION: patient laying supine with knee straight, or sitting w knee held in 90º flexion

LANDMARKS OUTLINED: patella (bursa lies between skin and patella
TISSUE TO AVOID: no important neuro/vascular structures
PREP- betadine, alcohol wipe, may use local anesthetic (lidocaine, ethylchloride)
NEEDLE INSERTION- insert 18-20g 11/2 needle thru anesthitized skin into bursa aspirate and examine fluid.
if appropriate change syringes and inject steroid
DEPOSITION: aspirate, inject by bolus 1ml lido 1%, 10-20mg TAC
OBSERVE PATIENT- watch for vaso-vagal reaction, apply gentle "healing" massage and range of motion, re-examine for improvement of symptoms
PATIENT EDUCATION reinforce wholisitic approach, provide post injection instructions and f/u



PLANTAR FASCITIS

- HISTORY: age over 40, more commonly female, pain worse after first few steps in the A.M. or first few steps after sitting for a prolonged time, eases off w walking, pain in bottom of heel area
- PHYSICAL EXAM: point tender over plantar fascia at medial calcaneal tubercle, may increase pain w ankle dorsiflexion and big toe extension
- XRAY- may or may not show calcaneal spur


Achilles Tendon
Tibialis Posterior
Calcaneus
Plantar Fascia
Flexor Digitorum Longus

PLANTAR FASCITIS INJECTION

PATIENT POSITION: patient laying prone with knee flexed at 90º

LANDMARKS OUTLINED: point of maximum tenderness, located by following plantar fascia toward medial calcaneal tubercle (plantar fascia is accentuated w ankle dorsiflexion)

TISSUE TO AVOID: no important neuro/vascular structures

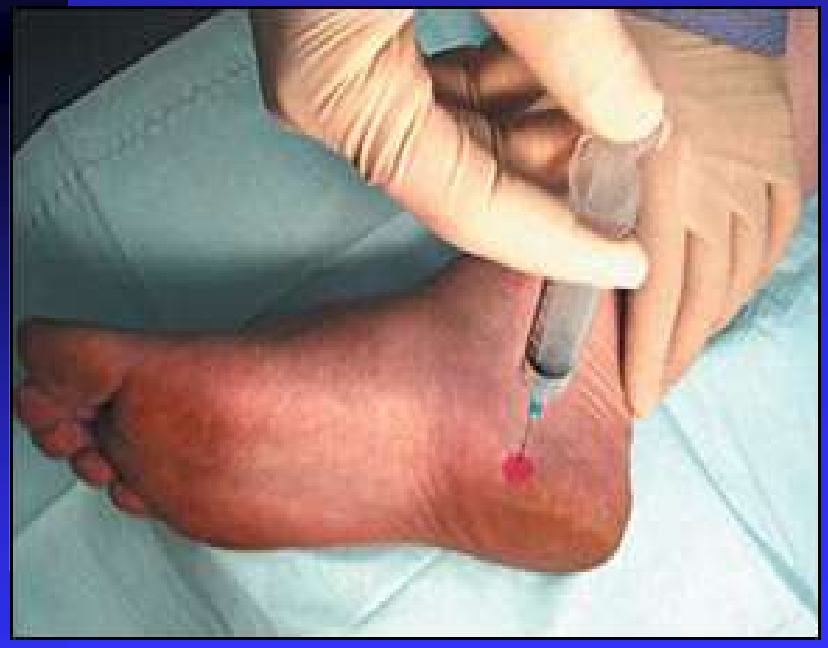
PREP- betadine, alcohol wipe, may use local anesthetic (lidocaine, ethylchloride)

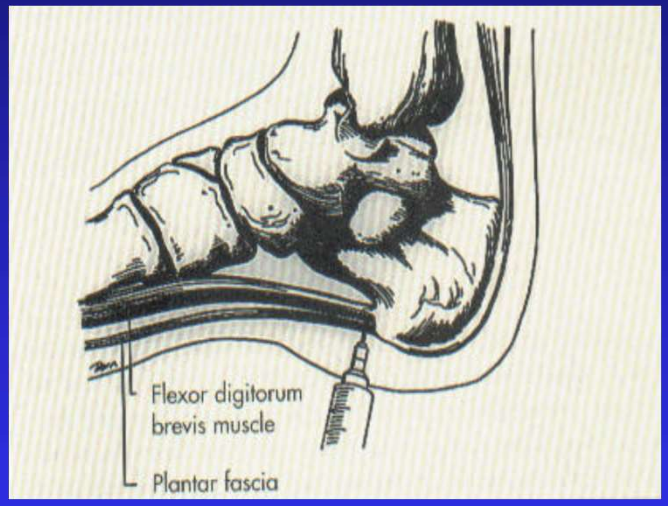
NEEDLE INSERTION- insert 22-25g 11/2”needle thru anesthetised skin at medial aspect of heel, aiming at point of maximum tenderness if fascia (thick gritty sensation) or bone is felt w needle withdraw 1-2mm

DEPOSITION: aspirate,inject by peppering in a quadrential process 1-2ml lido 1%, 10-20mg TAC

OBSERVE PATIENT- watch for vaso-vagal reaction, apply gentle “healing” massage and range of motion, re-examine for improvement of symptoms

PATIENT EDUCATION: reinforce wholisitic approach, provide post injection instructions and f/u



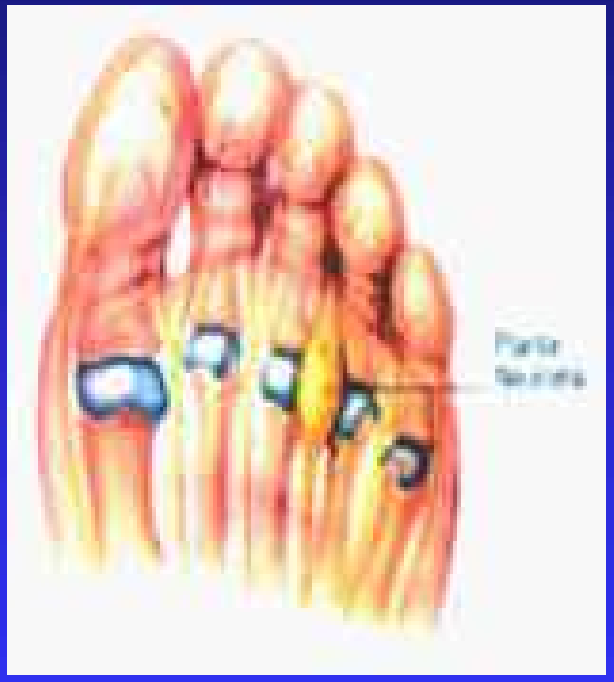

Flexor digitorum
brevis muscle
Plantar fascia

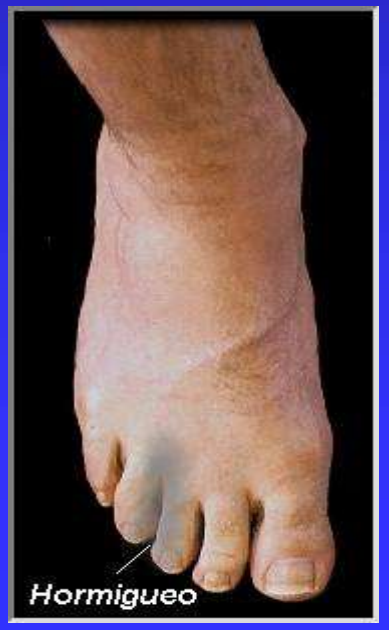
INTERDIGITAL NEUROMA (MORTON'S NEUROMA)

- HISTORY:age most commonly 30-60, female to male ratio 4:1, sharp shooting pain at ball of foot may radiate to toes, feels like walking on a marble, increased w tight fitting shoes

- PHYSICAL EXAM: exquisite pain to palpation usually between 3rd & 4th metatarsal heads (sometimes 4th & 5th), may also be painful when compressing metatarsal heads together

- XRAY- may be normal




Hormigueo

INTERDIGITAL NEUROMA (MORTON'S NEUROMA) NJECTION

PATIENT POSITION: patient laying supine with knee straight, or sitting w knee held in 90º flexion

LANDMARKS OUTLINED: metatarsal heads

TISSUE TO AVOID: digital artery, nerve

PREP- betadine, alcohol wipe, may use local anesthetic (lidocaine, ethylchloride)

NEEDLE INSERTION- insert 22-25g 11/2"needle thru anesthtized skin at dorsal aspect of involved web space, aim plantarward, feel transverse inter metatarsal ligament (gritty sensation)

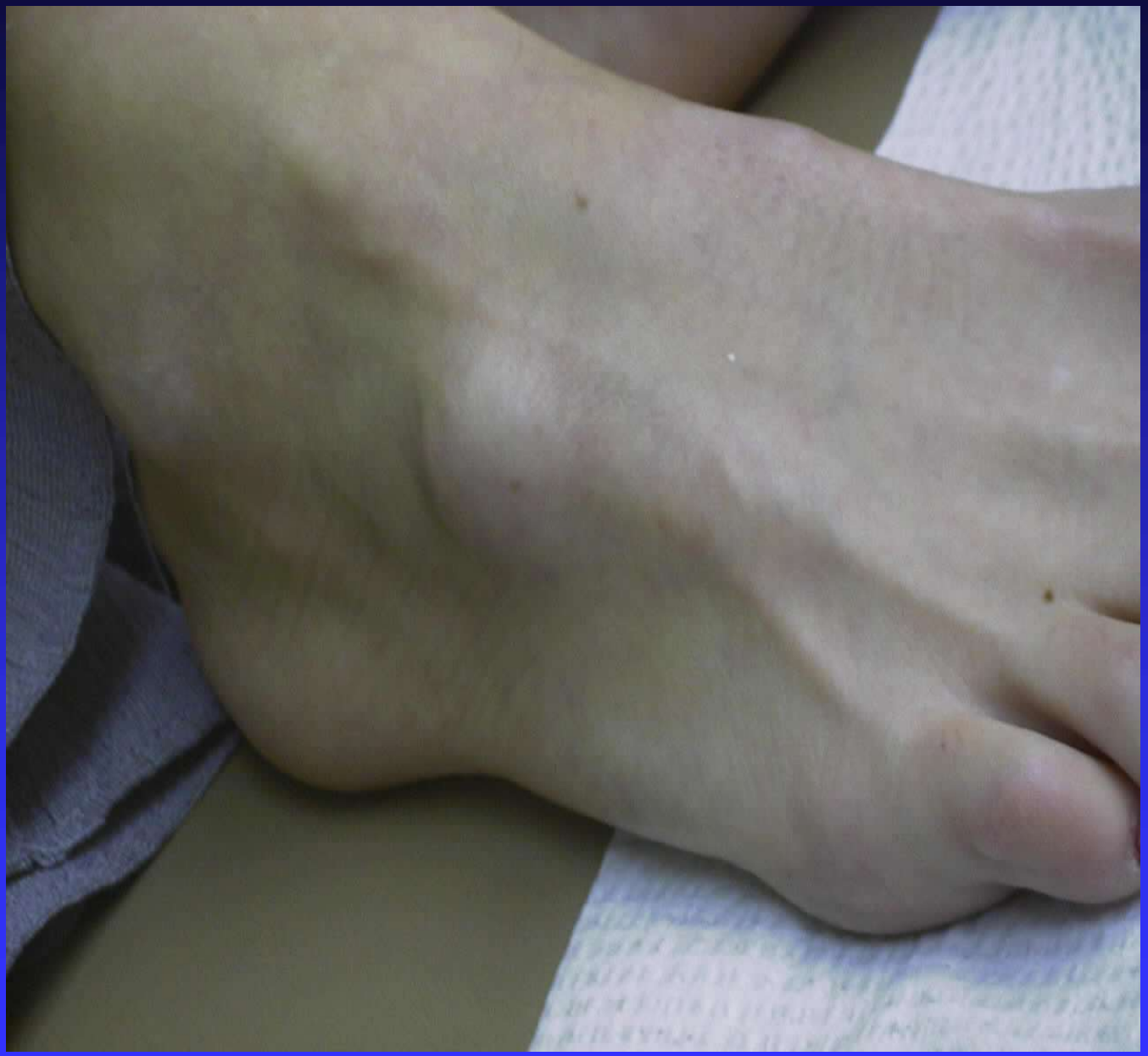
DEPOSITION: aspriate, inject by bolus 1-2 ml lido 1%, 10-20mg TAC feel bulge plantar aspect of foot, be careful not to have needle go thru plantar surface

OBSERVE PATIENT- watch for vaso-vagal reaction, apply gentle "healing" massage and range of motion, re-examine for improvement of symptoms

PATIENT EDUCATION: reinforce wholisitic approach, provide post injection instructions and f/u

GANGLION

- HISTORY: swelling on dorsum of foot/ankle, may come and go, pay or may not be painful
- PHYSICAL EXAM: firm, spherical, cystic swelling more prominent w plantarflexion, not significantly painful
- XRAY-may be normal



GANGLION ASPIRATION & INJECTION

PATIENT POSITION: patient laying supine with knee bent, foot flat on exam table

LANDMARKS OUTLINED: cystic swelling

TISSUE TO AVOID: superficial veins, dorsalis pedis artery

PREP- betadine, alcohol wipe, may use local anesthetic (lidocaine, ethylchloride)

NEEDLE INSERTION- insert 30g ½" needle, anesthetize epidermis w 1/2cc lido 1%, also inject 1ml into cyst (will help to aspirate fluid), thru anesthetized skin insert18-20g 11/2" needle aspirate fluid. (may need to compress cyst to help in aspiration) if appropriate change syringes and inject

DEPOSITION: aspriate, inject by bolus 1 ml lido 1%, 10-20mg TAC

OBSERVE PATIENT- watch for vaso-vagal reaction, apply gentle "healing" massage and range of motion, re-examine for improvement of symptoms

PATIENT EDUCATION: reinforce wholisitic approach, provide post injection instructions and f/u

Objectives:

Identify indications, contraindications, risks, benefits, materials and proper injection techniques.

Identify common conditions of the upper and lower extremities that may benefit from injection therapy.

Obtain and document informed consent.

Demonstrated beginning competencies regarding the location and identification of important functional anatomical landmarks.

Demonstrate beginning competencies regarding the proper location for correct needle placement for injection therapy.