

BIOPSY OF BONE AND SOFT TISSUE SARCOMAS

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The Biopsy

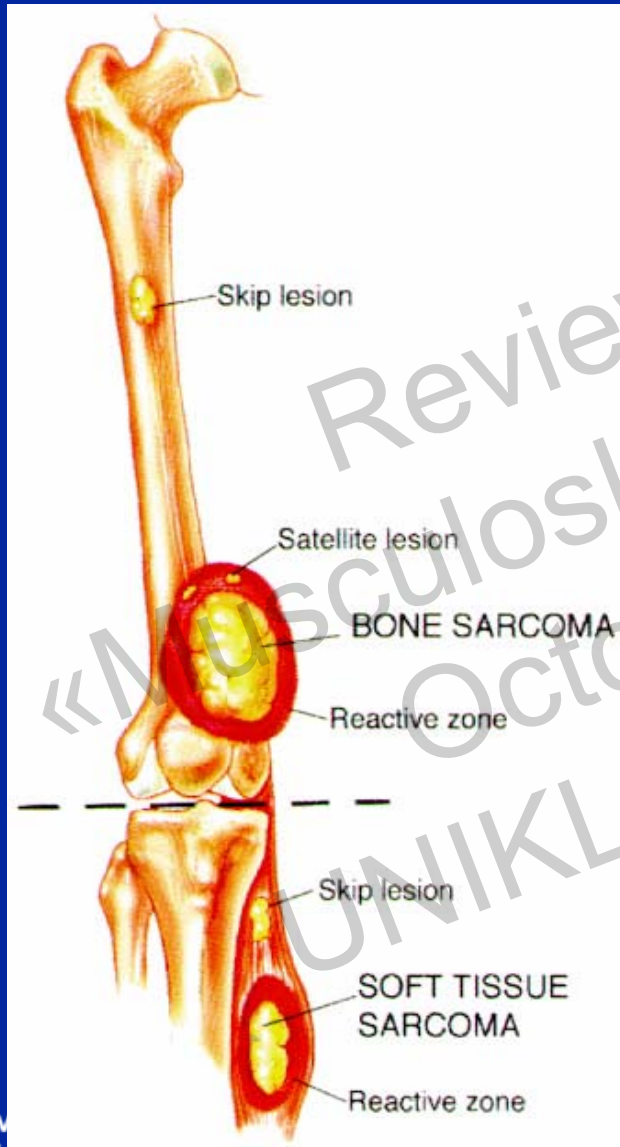
deceptively simple procedure....

....yet a cognitively complex event !

THE BIOPSY

**technique of harvesting a
representative sample of tissue
without compromising definitive
care.**

BIOLOGY OF SARCOMAS



characteristics:

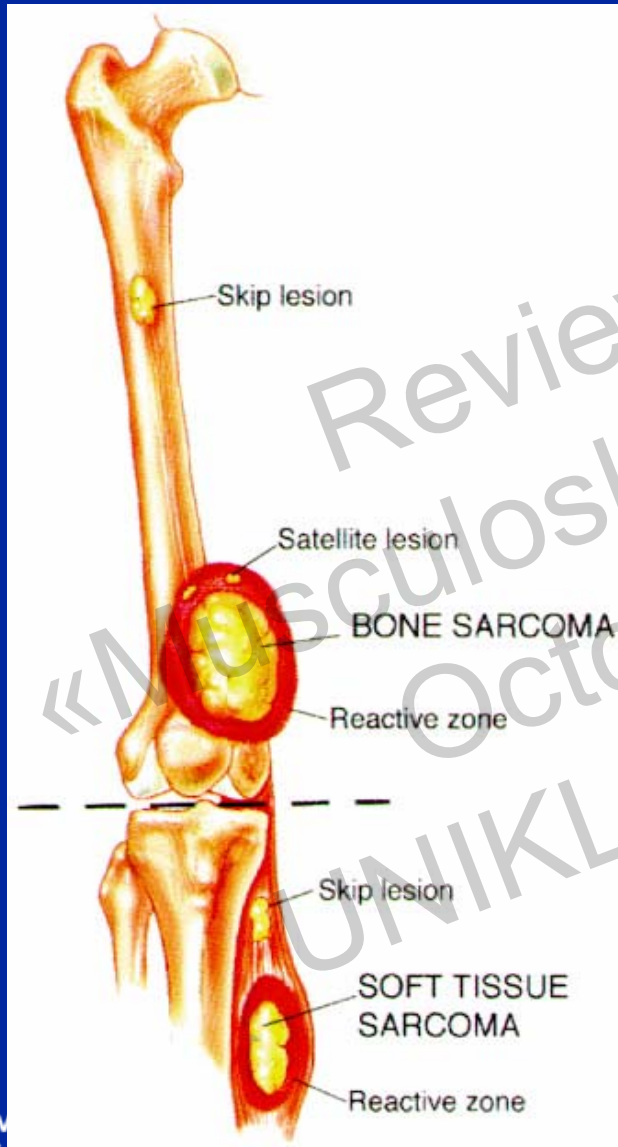
centripetal growth, most immature part at leading edge (unlike carcinomas, sarcomas do „push“, not infiltrate)

reactive zone:

tissue between tumor and surrounding normal tissue (prolif. of mesenchymal cells, neovasculature, and inflammation)

Bickels J et al CORR 368: 1999

BIOLOGY OF SARCOMAS



satellite lesion:
nodules/microextensions
of tumor
(not metastatic phenomenon)

skip lesion:
nodules outside reactive
zone, but within same
compartment



Review Course
«Musculoskeletal Oncology»
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UNIKLINIK BALGRIST

Carcinoma: from epithel, mesothel forms capsule

Sarcoma: from mesothel, no true capsule

WHEN TO BIOPSY ?

Clinical Exam

difficult, because..... think of it !

pain?

size?

depth ?

mobility?

growth?

skin changes?

WHEN TO BIOPSY?

Imaging

difficult, because.....rare and non-specific !

benign



malignant



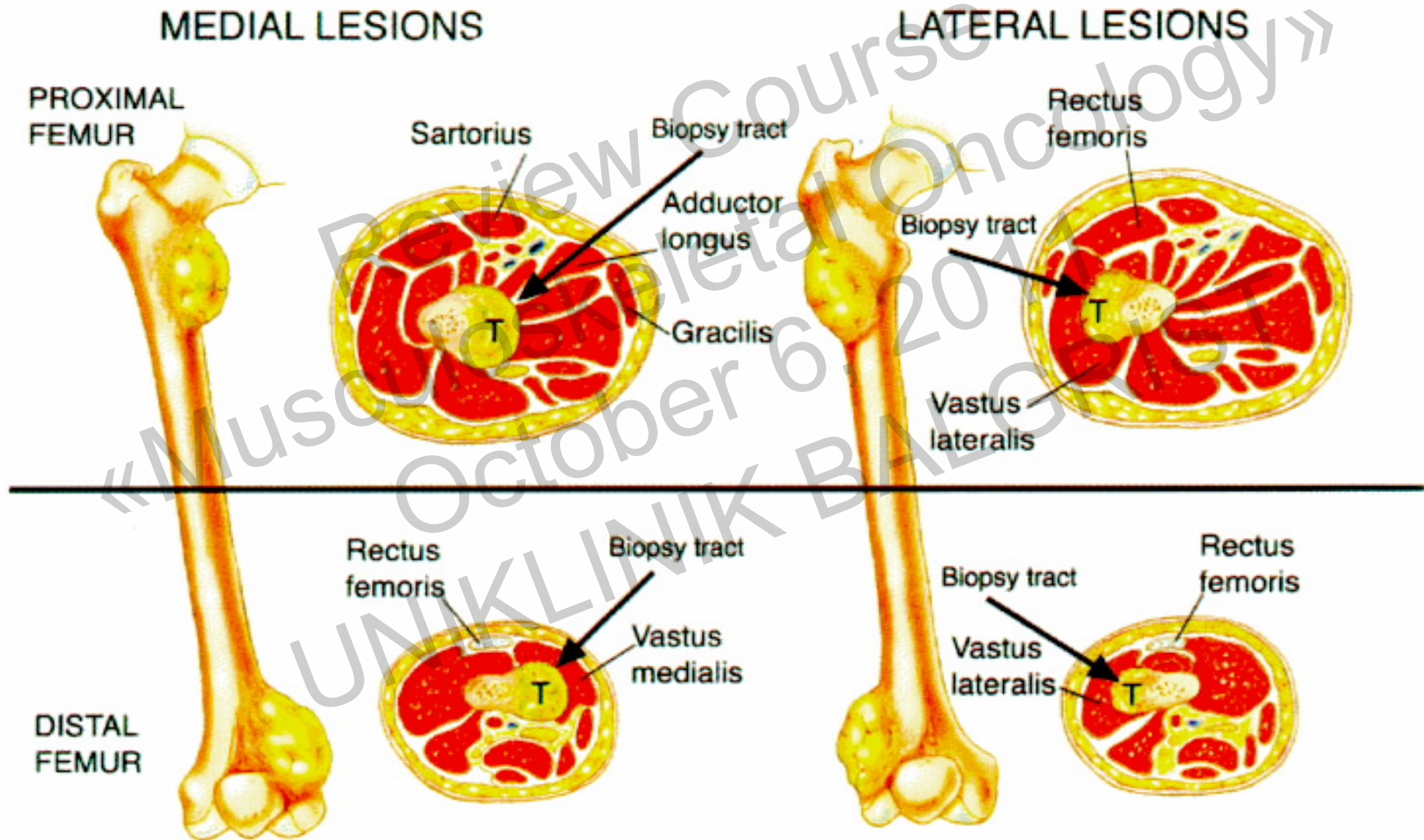
HOW TO BIOPSY ?

decide before bx about most representative part

- position the point of entry along planned incision
- bx tract with shortest way to lesion, without violating more than 1 compartment
- avoid contamination of
 - neurovascular structures
 - joints
 - bone/other uninvolved structures

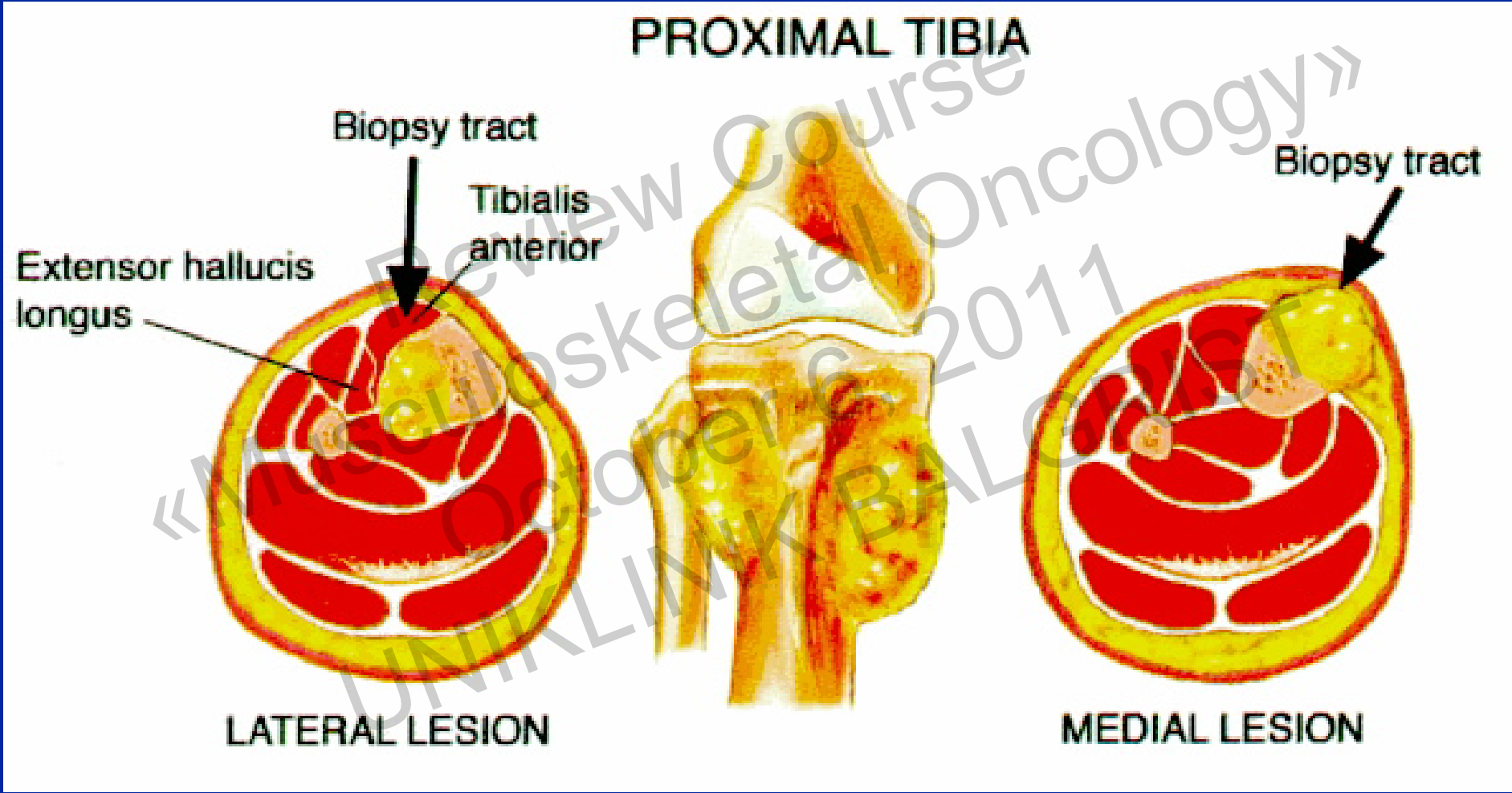
HOW TO BIOPSY ?

Proximal and Distal Femur



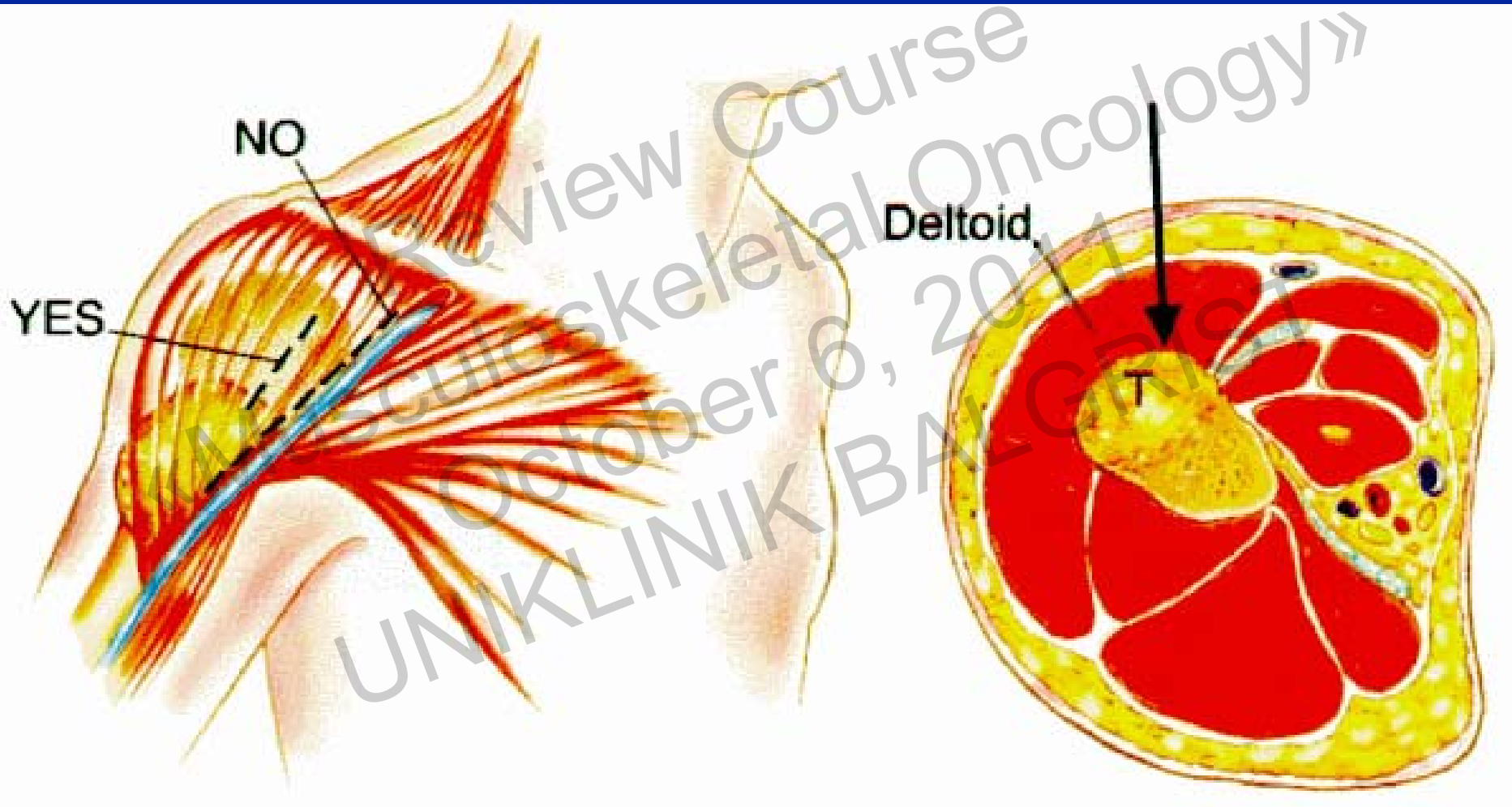
HOW TO BIOPSY ?

Proximal Tibia



HOW TO BIOPSY ?

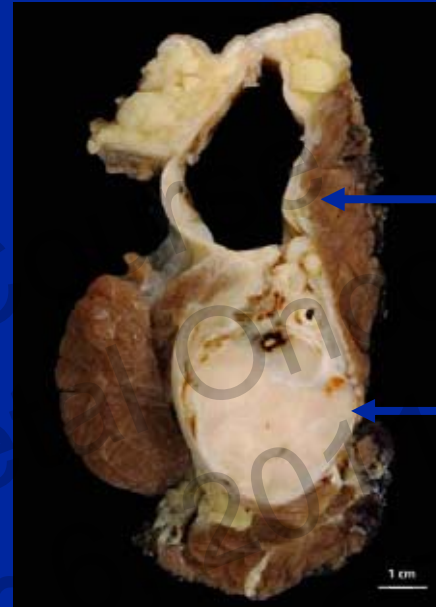
Proximal Humerus



HOW (TECHNICALLY) TO BIOPSY ?

1.) open Biopsy

- Incision-Biopsy
- Excision-Biopsy



seroma

tumor

2.) trocar biopsy (Needle 14-18G)

- CT- / US-guided / Im-Int.



3.) Fine needle biopsy (Needle 22-25G)

(recurrences, metastasis)

BIOPSY - GUIDELINES

Excision-Biopsy:

small tumors <3-5cm

- osteochondroma
- superficial soft tissue lesion
 - avoid NV contamination



EXZISIONS - BIOPSIE

- obvious lesions (when diagnosis is safe clinically and radiologically)

- Lipoma

- Ganglion

- Schwannoma

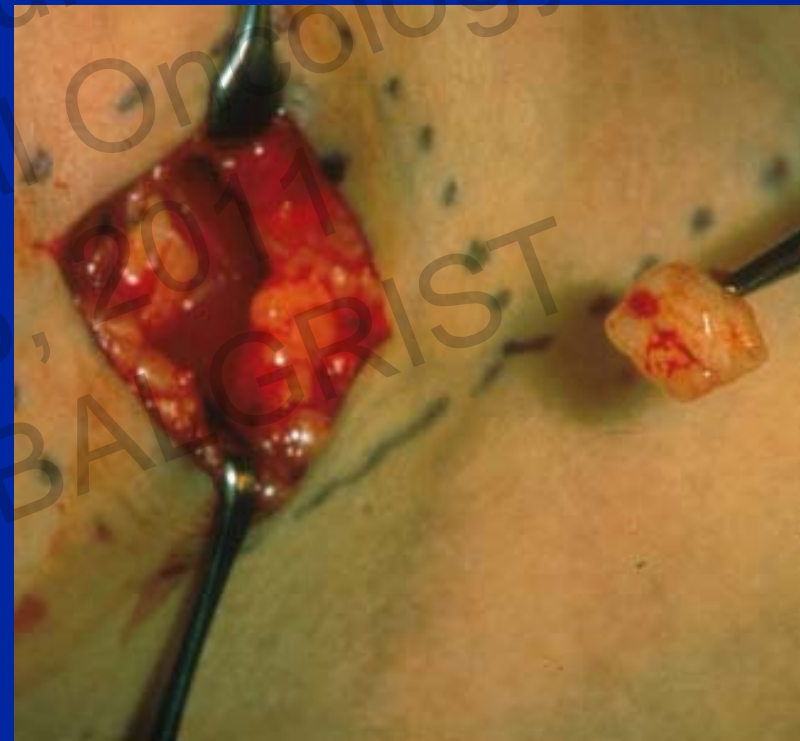
- Neurofibroma



BIOPSIE - GUIDELINES

Incision - Biopsy: suspected sarcomas

→ if pathology is inconclusive or
when there is no correlation
between clinic and imaging



INCISION – BIOPSY.... ADVANTAGES

larger tissue volume

- special studies
- molecular studies
- more precise grading

→ ↓ risk of sampling error

INCISION BIOPSY - DISADVANTAGES

- risk of infection
- risk of fracture
- costs
- tumor spill
 - ? ↑ LR



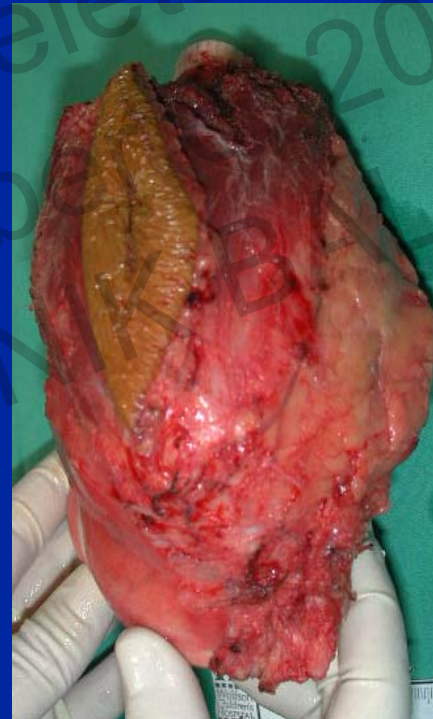
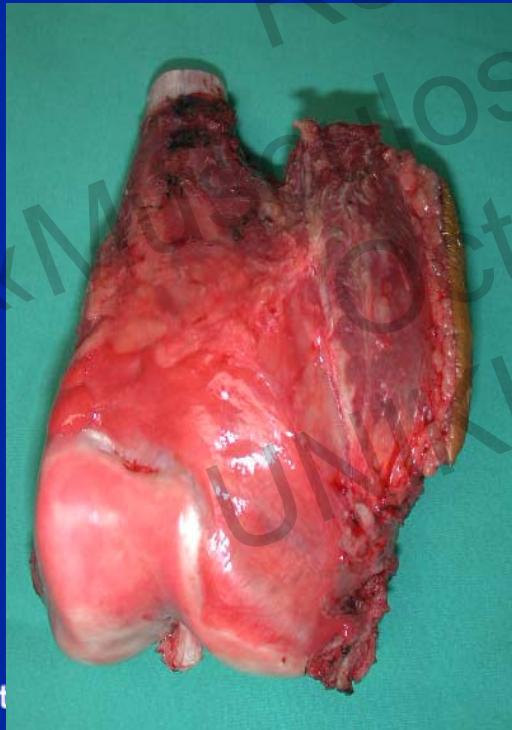
OPEN BIOPSY - TECHNIQUE

- **exsanguination**
by gravity
- **use a Tourniquet**



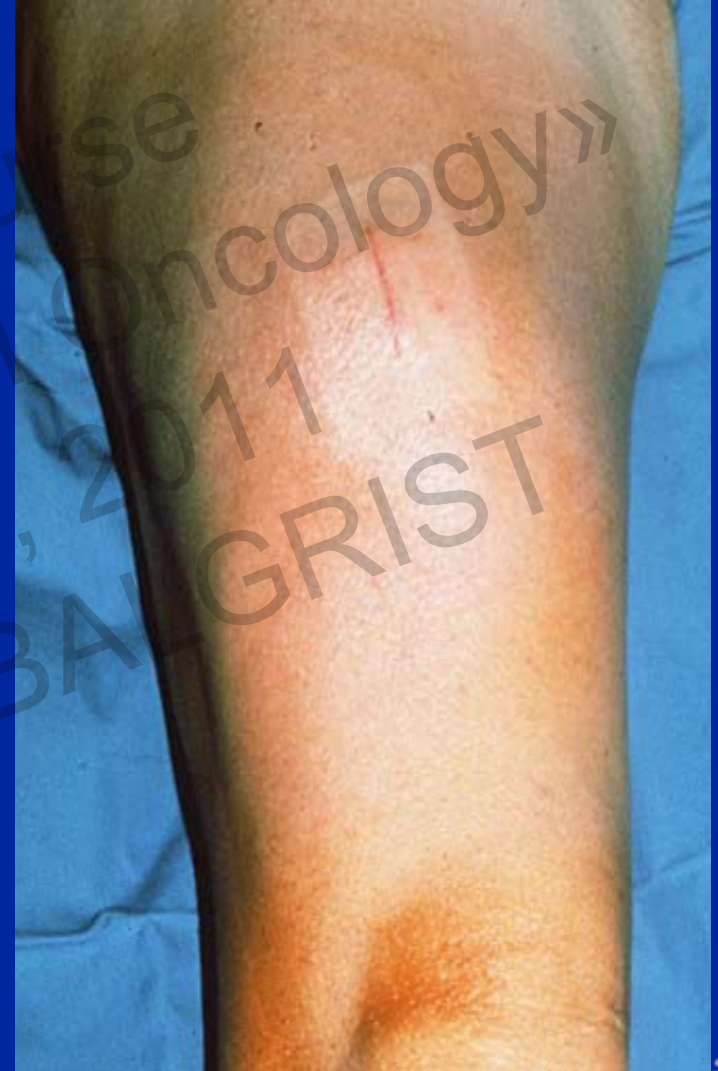
OPEN BIOPSY - TECHNIQUE

plan the biopsy such that it lies in the planned incision of definite surgery



OPEN BIOPSY - TECHNIQUE

- longitudinal
- straight
- short, but adequate
- paralleling muscle below



OPEN BIOPSY - TECHNIQUE

longitudinal

- straight
- short, but adequate
- paralleling muscle below



OPEN BIOPSY - TECHNIQUE

3 simple rules

1. Do not use a transverse incision



OPEN BIOPSY - TECHNIQUE

3 simple rules

1. Do not use a transverse incision
2. Do NOT use a transverse incision



OPEN BIOPSY - TECHNIQUE

3 simple rules

1. Do not use a transverse incision
2. Do NOT use a transverse incision
3. *Just don't do a transverse incision*



OPEN BIOPSY - TECHNIQUE

- direct approach
- minimal dissection
- avoid:
 - joints
 - compartments
 - NV structures



OPEN BIOPSY - TECHNIQUE

- **bone window***
 - small circular
 - enlarge ovally
 - metaphysis preferred
 - Meticulous hemostasis



*if there is soft tissue part, bone window is usually not necessary

OPEN BIOPSY - TECHNIQUE

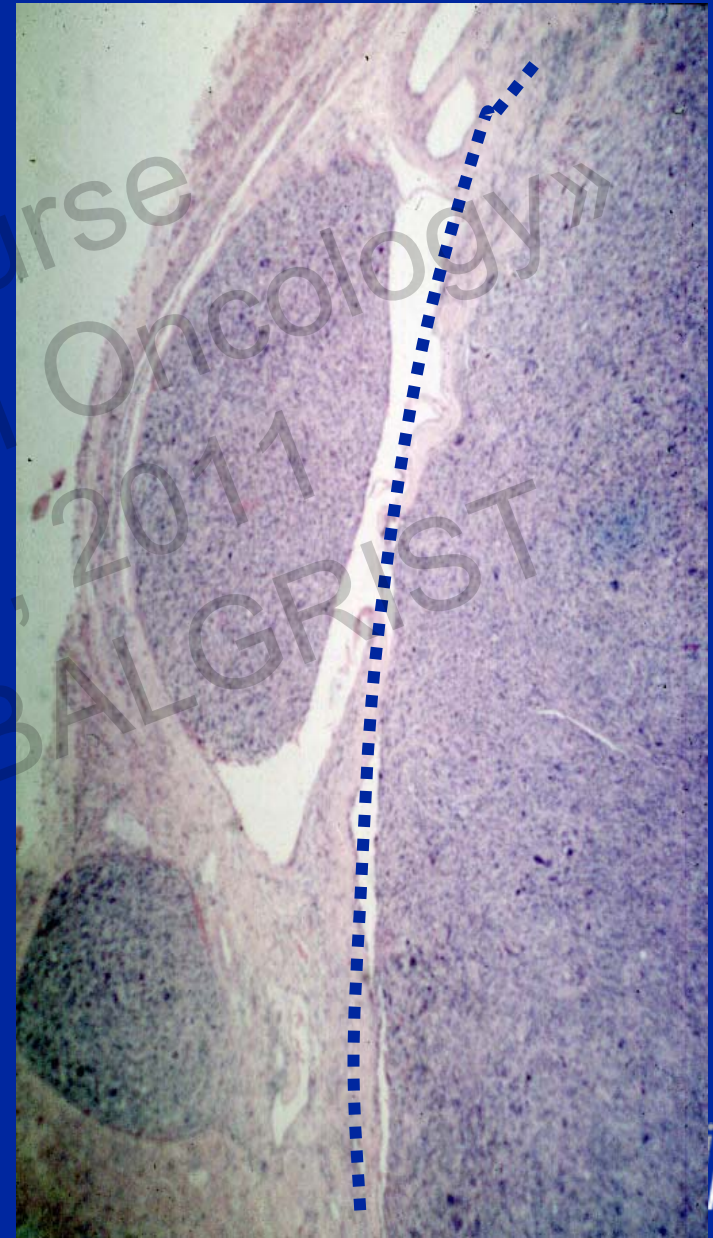
- **choose the least differentiated part**
 - typically the least mineralised part
- **use a knife, do not crush tissue**



Osteosarcoma

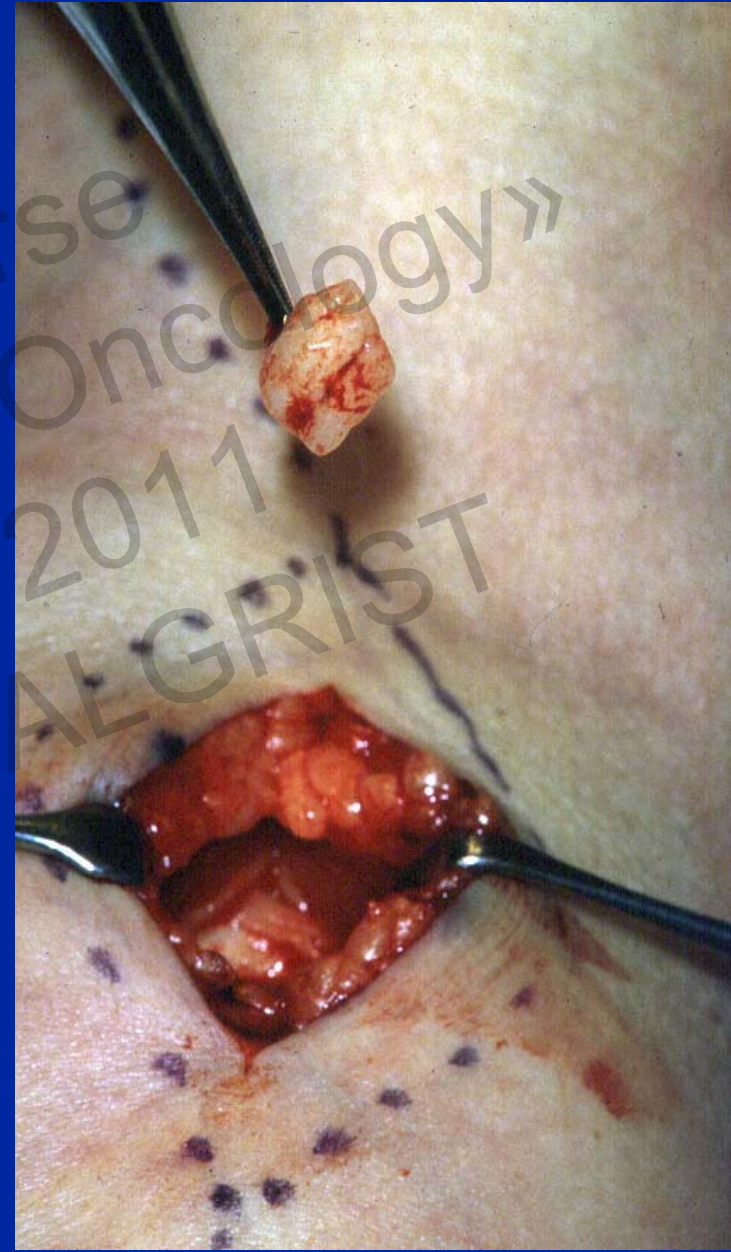
OPEN BIOPSY - TECHNIQUE

Do not shell it out...



OPEN BIOPSY - TECHNIQUE

- don't crush specimen
- avoid curettes
- keep moist
- give to waiting pathologist
- send fresh

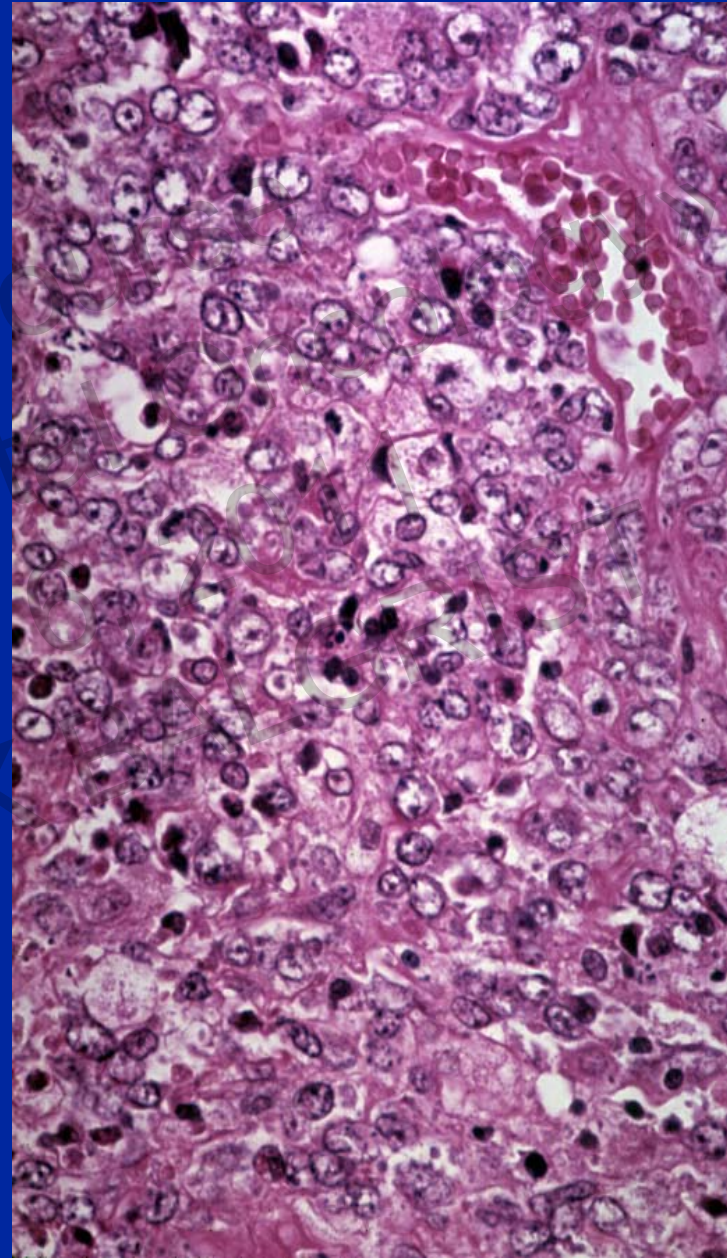


OPEN BIOPSY – FROZEN SECTION

Is it viable ?

Is it enough?

Is it representative?



OPEN BIOPSY - TECHNIQUE

- good hemostasis
- Gelfoam or cement
- Drain if necessary
- in line with the incision



OPEN BIOPSY - TECHNIQUE

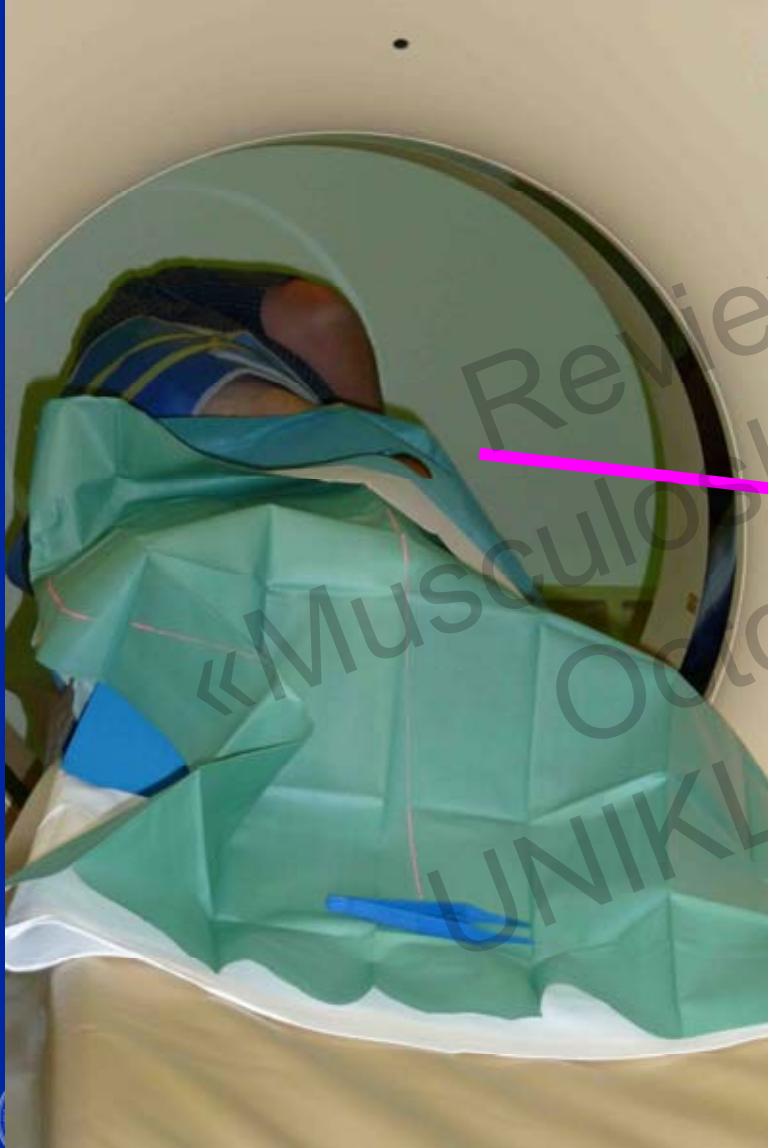
accomplish
your goal, then
STOP!



RULES FOR THE OPEN BIOPSY

1. smallest longitudinal incision
2. do not squeeze the tissue
3. obtain enough tissue for diagnosis
4. culture what you biopsy, and biopsy what you culture
5. meticulous hemostasis
6. use drains when necessary

The Biopsy...*minimally invasive Biopsies*



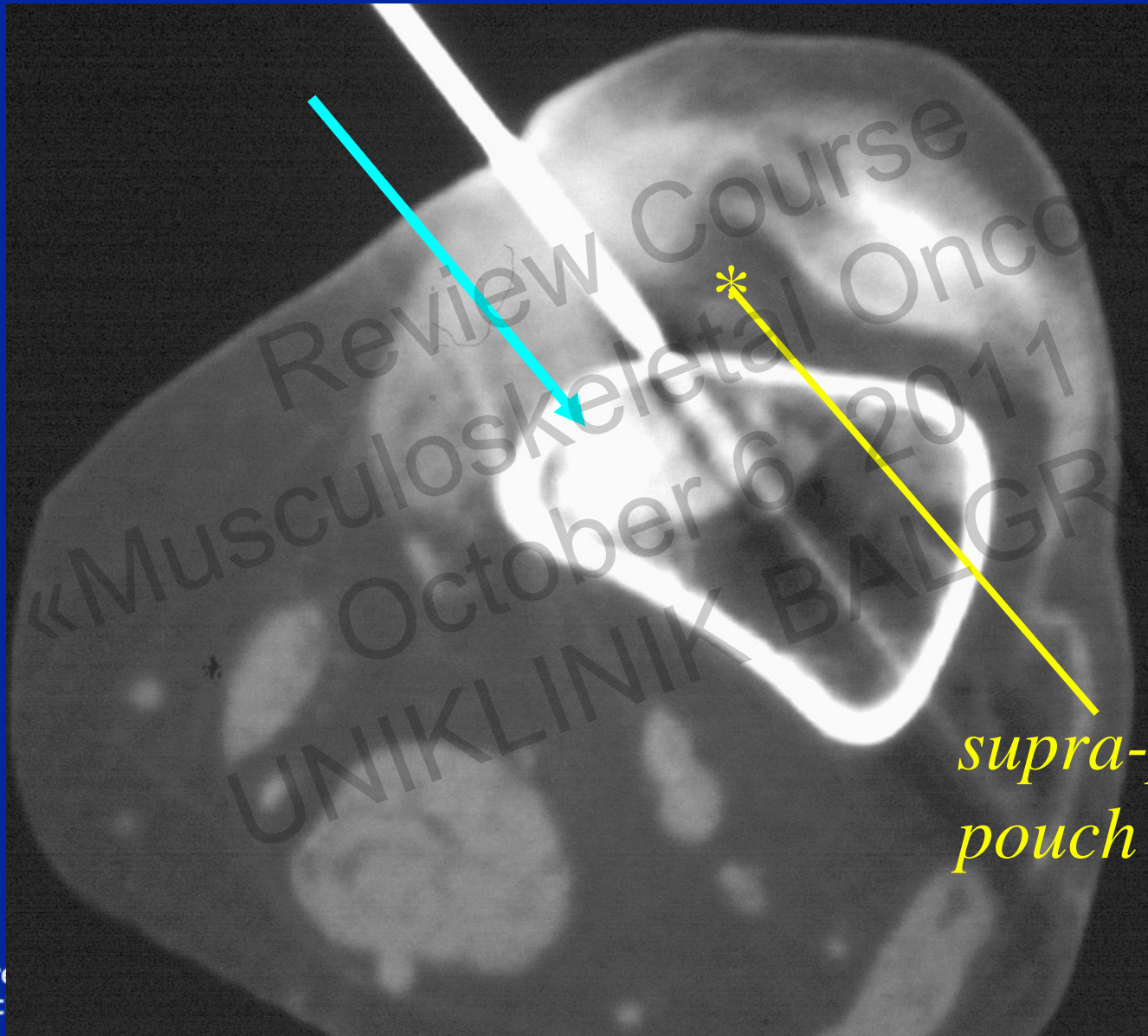
multiple samples from
different parts are taken

The Biopsy...*minimally invasive Biopsies*



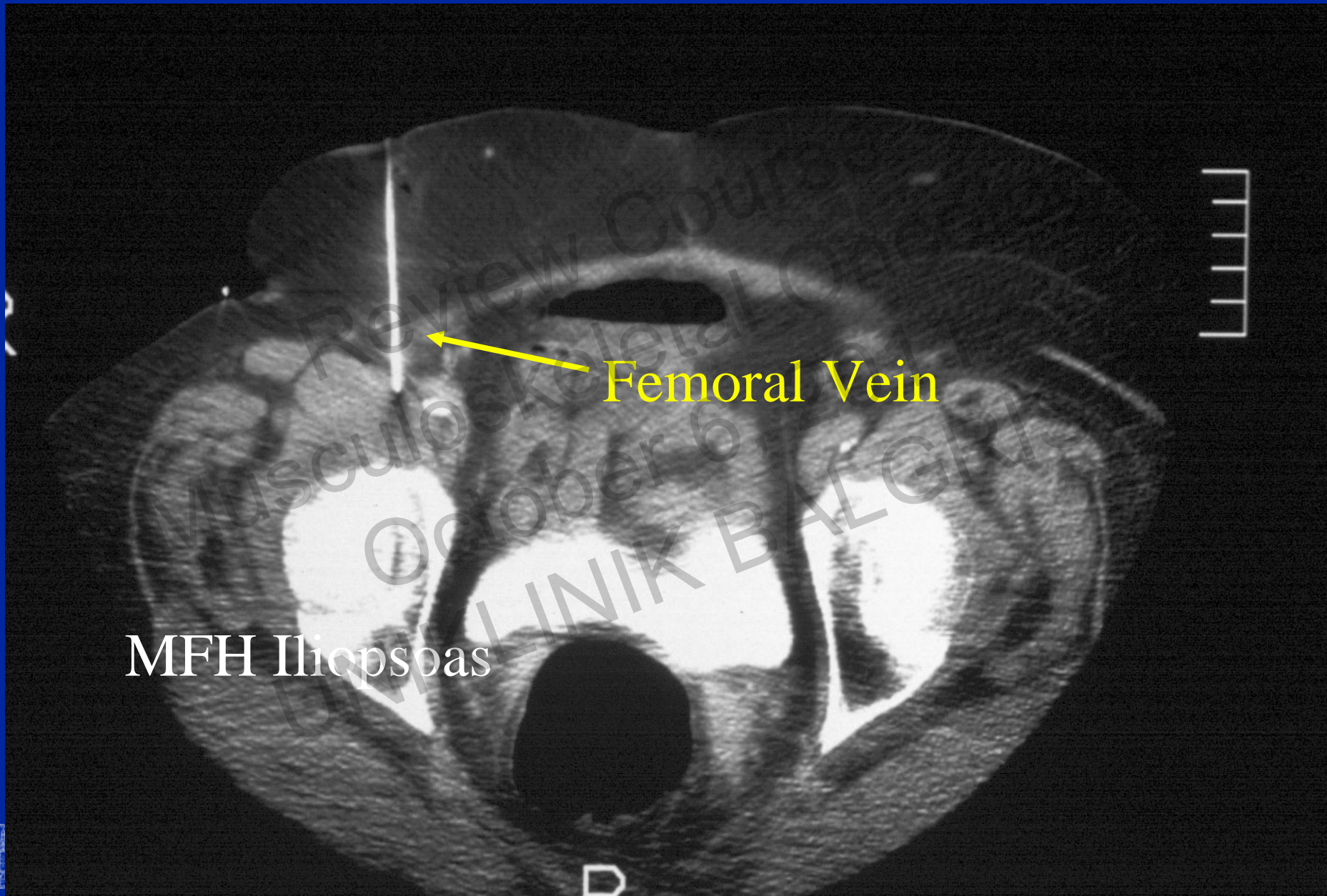
multiple samples from
different parts are taken

The Biopsy...*minimally invasive Biopsies*



*supra-patellar
pouch*

The Biopsy...*minimally invasive Biopsies*



The Biopsy...*minimally invasive Biopsies*



WHO SHOULD DO THE BIOPSY?

142 pts w. musculoskeletal tumors treated @ one institution during 2002; outcome bx before referral or at treating inst.

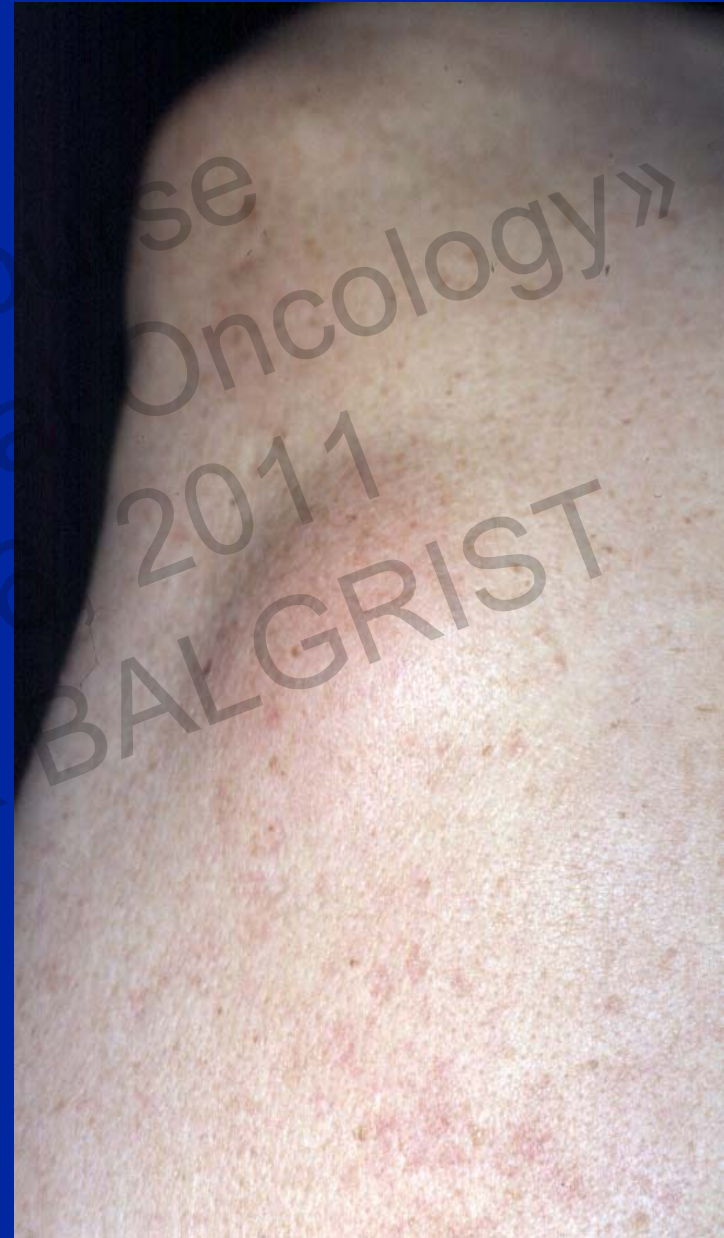
- badly performed bx hindered treatment in 38%
- change in definitive treatment in 28%
(more radical or palliative)

→ outside biopsy = increased risk for

- incomplete excision requiring reexcision
- amputation
- adjuvant RT

TAKE HOME MESSAGES

Lipomas are
removed only for
cosmetic reasons
not to find out what
they are...



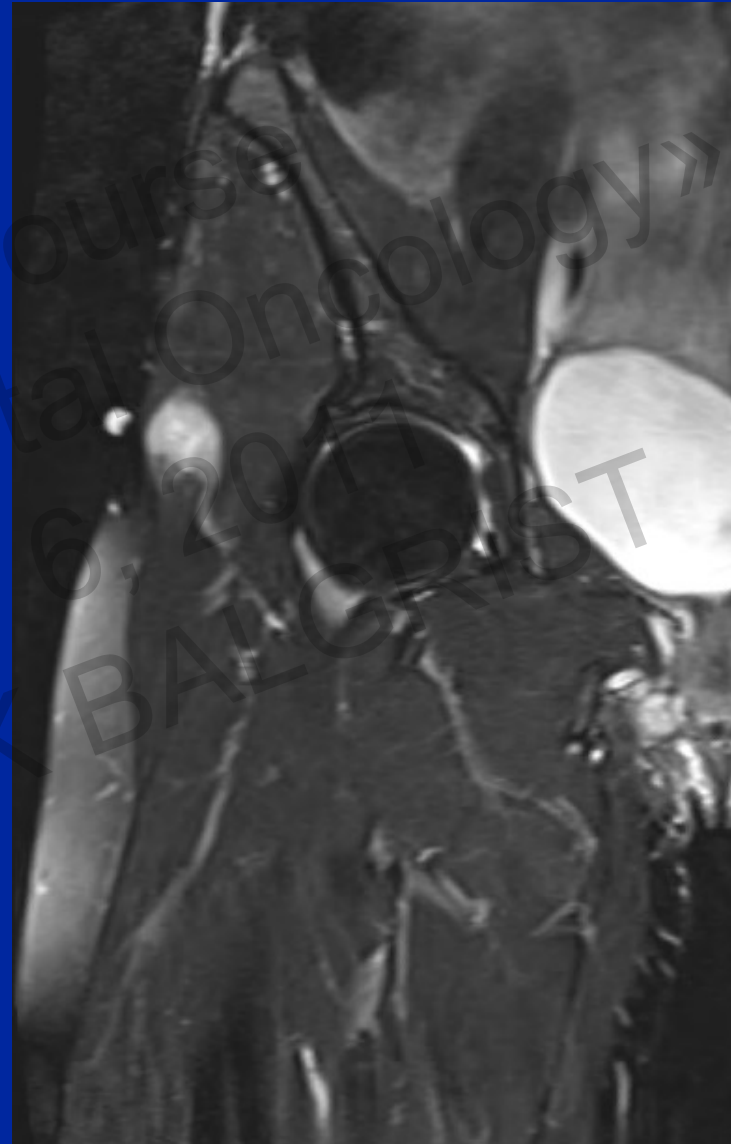
TAKE HOME MESSAGES

A lipoma is a distinct clinical entity diagnosed by physical examination, if it is not a typical lesion, it *needs* to be investigated...



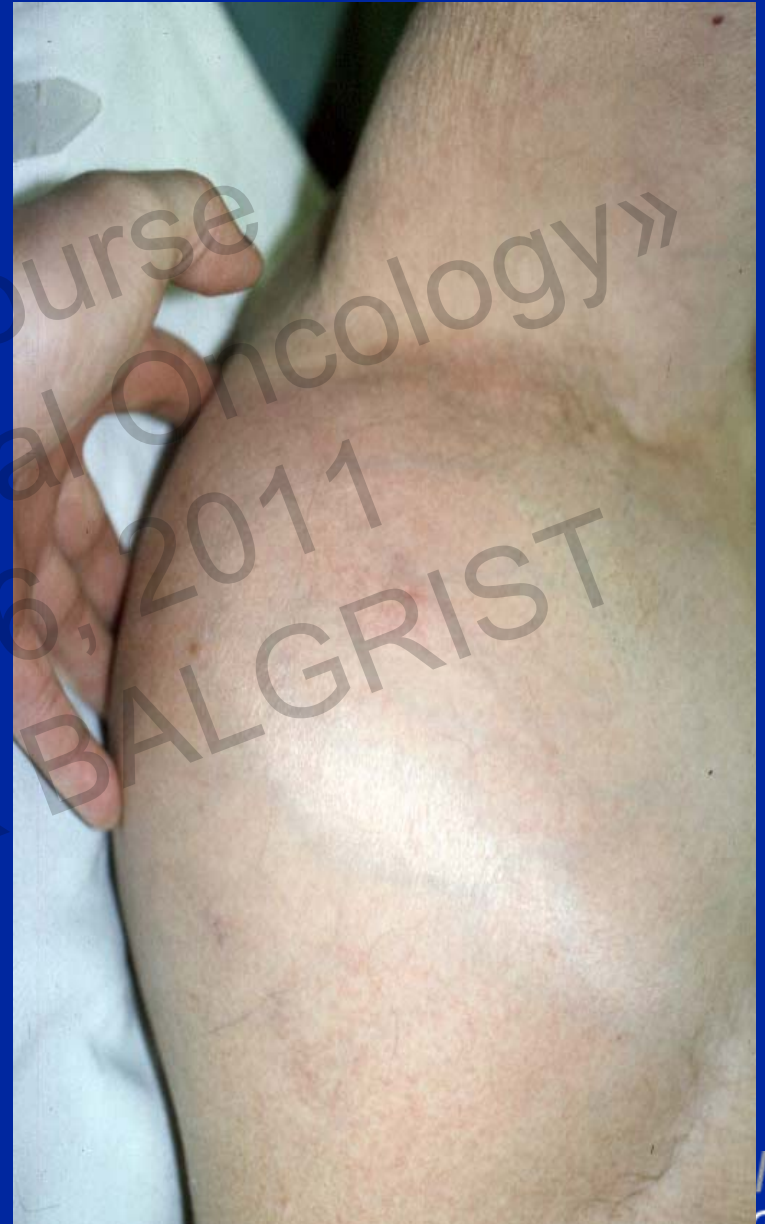
TAKE HOME MESSAGES

when the lesion is superficial, an **excisional biopsy** is performed for a suspicious non-lipoma like lesion < 3-5cm.



TAKE HOME MESSAGES

Every subfascial mass is malignant until proven otherwise by either history, physical examination, imaging or a biopsy...



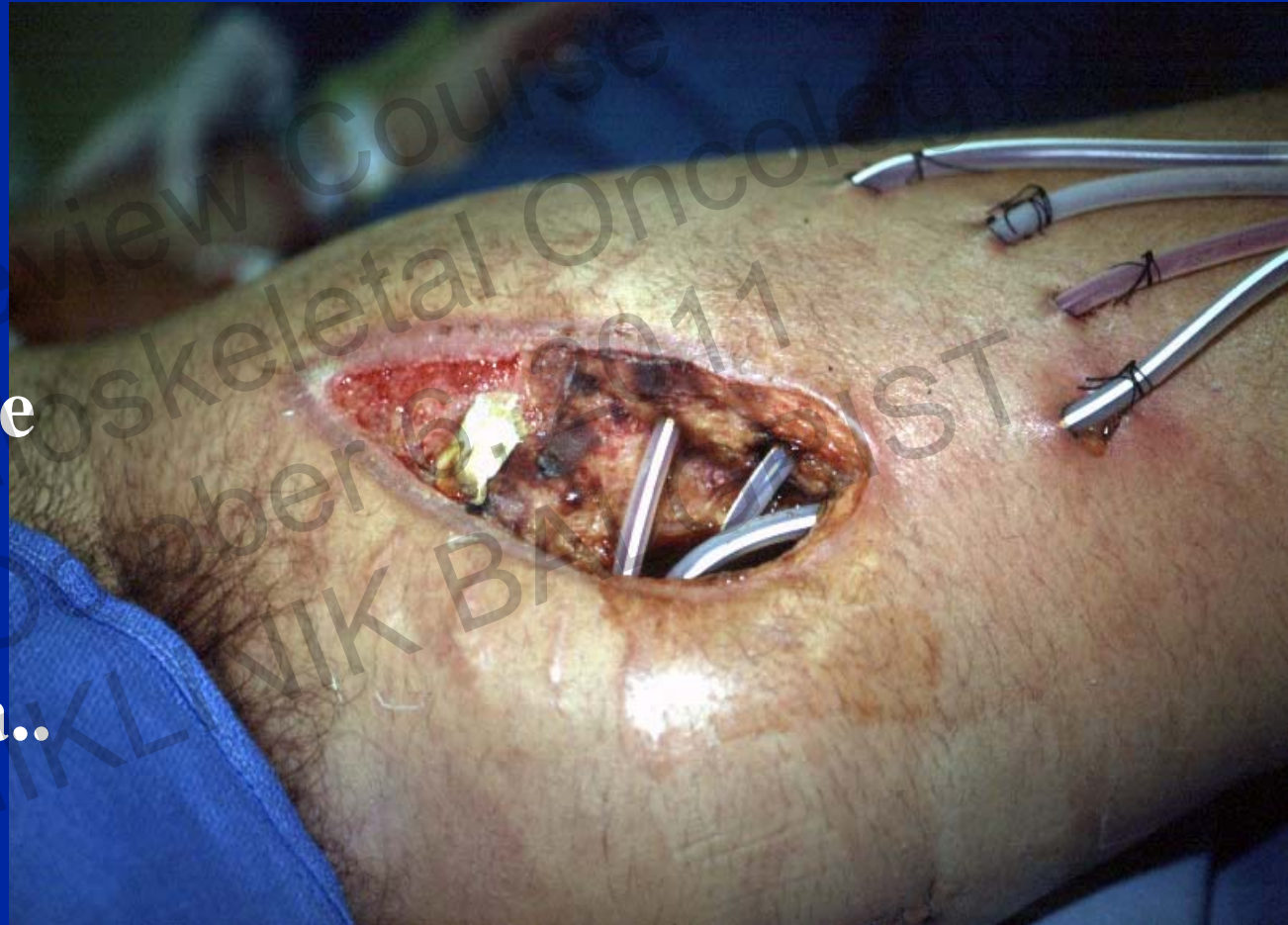
TAKE HOME MESSAGES

The biopsy is performed only *after* all of the radiographic images are obtained. The MR is severely compromised by procedural edema...



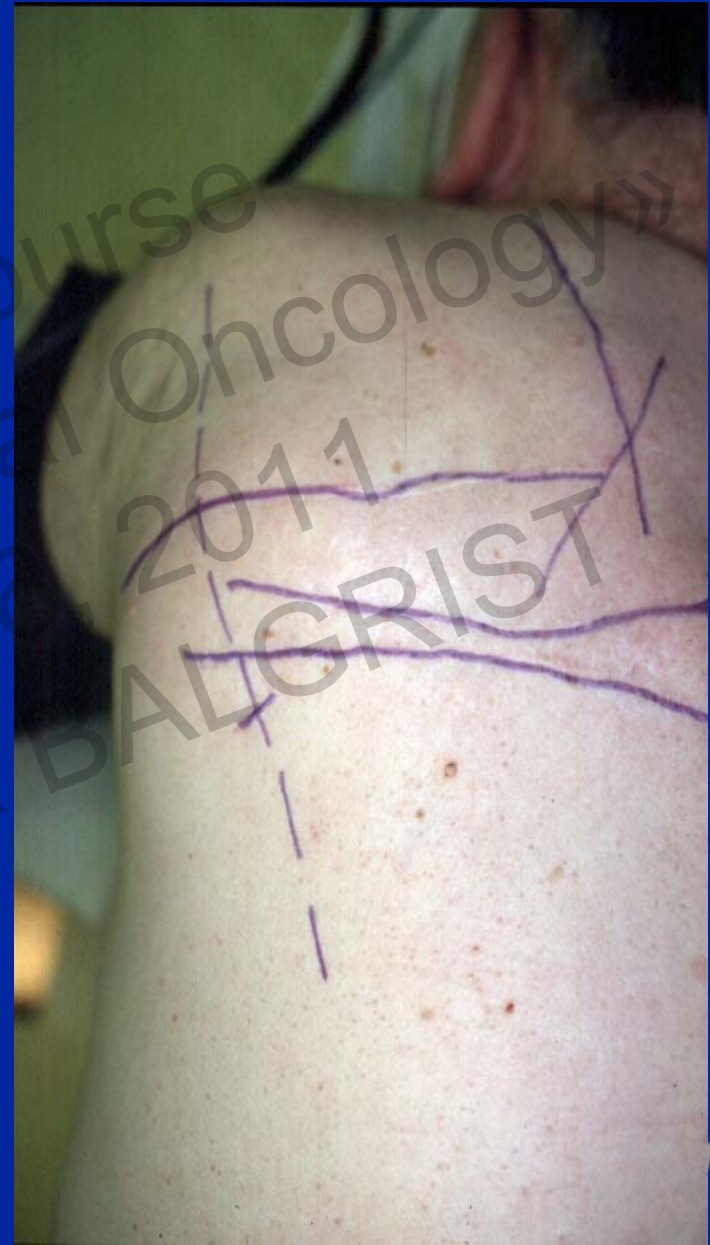
TAKE HOME MESSAGES

Never make a diagnosis of a *hematoma* in the absence of significant and obvious trauma..



TAKE HOME MESSAGES

Treat what you
know it is, not what
you *think* it is



TAKE HOME MESSAGES

if your plan is to do
a biopsy, just do a
biopsy...



The Biopsy

„....if the surgeon or the institution is not prepared to perform accurate diagnostic studies, or proceed with definitive treatment for these patients, then the patients should be referred to a treating center before the biopsy.“

The Biopsy

deceptively simple procedure....

....yet a cognitively complex event !

THANK YOU !

