STAGING, BIOPSY AND NATURAL HISTORY OF TUMORS

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WHAT DO YOU DO WHEN THIS SHOWS UP IN YOUR OFFICE? ... besides panicking
KEY PRINCIPLE!!!

Reactive zone is the edema, neovascularity and inflammation that attempts to ‘wall off’ the tumor.
Reactive zone
IMPORTANT CONCEPTS

• **BENIGN TUMOR**
  • No tumor beyond the pseudocapsule
  • Limited reactive zone

• **MALIGNANT TUMOR**
  • *Always* malignant cells (satellites) in pseudocapsule and in reactive zone... therefore, shell-out never appropriate
STAGING

• Local staging
  • XRay all bone and soft tissue tumors
  • MRI test of choice

• Distant staging
  • CT chest and abdomen for all potential sarcomas
  • Bone scan (whole body) for bone sarcomas
  • ?PET scans
BIOPSY

• Complete staging prior to biopsy
  • To avoid necrotic regions at biopsy
  • Defines reactive zone (biopsy site distorts it)
  • May suggest a sarcoma and possible referral
  • The entire biopsy tract needs excised
  • *Bad biopsies DO compromise outcomes*
PERONEAL NERVE CONTAMINATED

BIOPSY THROUGH THE FASCIA

JOINT CONTAMINATION

IMPOSSIBLE TO EXCISE
Types of biopsies

- **Fine needle aspiration (FNA)**
  - Not adequate for most soft tissue masses (best for metastatic, myeloma, lymphoma)
  - Yields few disconnected cells
  - Needs experienced pathologist
  - Still creates a hematoma
  - *Don’t trust a negative FNA if suspicion high*
Types of biopsies

- **Core biopsy (Tru-Cut)**
  - Best for large easily palpable masses away from major neurovascular structures
  - Yields cells plus surrounding stroma (sarcomas are diagnosed by patterns, not just cells)
  - Hematomas still occur, sometimes significant
Tru-Cut technique

- Small incision (marks site)
- Needle to edge of pseudocapsule
- DON’T past point (contaminates deeper structures)
- Multiple passes in different directions but same skin incision
Types of biopsies

- **Excisional (shell-out)**
  - ONLY for small superficial lesions and lesions of the fingers and toes
  - DO NOT violate deep fascia (watch sutures)
  - Same well-planned incisions
Finger salvage rarely indicated and most lesions are benign.
OPEN INCISIONAL

- Gold standard still
- Tourniquet without exsanguination
- Culture all biopsies and biopsy all infections... antibiotics after biopsy
- Consult with pathologist prior to biopsy
OPEN INCISIONAL

- Longitudinal biopsy along planned definitive resection
- Through expendable muscle
- Away from major NV structures
- Avoid dead spaces
DO YOU KNOW WHERE THE SCIATIC NERVE IS?
Avoid it !!! IF CONTAMINATED, IT NEEDS TO GO

AVOID MAJOR NERVES AND ARTERIES
OPEN INCISIONAL

- Biopsy the periphery and pseudocapsule
- Always get a frozen section (adequate sample, special study needs)
- Avoid crushing
- Hemostasis +/- drain in line with incision
- DO NOT SHELL OUT
- Subcuticular closure

SUMMA ORTHOPAEDICS
BASIC TREATMENT PRINCIPLES OF TUMORS
STAGING

• **Benign lesions** (based on radiographic, clinical features)

  1… latent lesion
  2… active lesion
  3… aggressive lesion
STAGING

• Malignant lesions (based on histology)
  I... low grade sarcoma
  II... high grade sarcoma
  III... metastatic

  A... intra-compartmental
  B... extra-compartmental
COMPARTMENTS

• Based on the fact that tumors spread along paths of least resistance
• Fascial or periosteal boundaries usually prevent tumor spread except for some aggressive sarcomas
• Once a sarcoma is into a compartment it can spread freely
SURGICAL MARGINS

INTRALESIONAL
Cuts into tumor, debulking
MARGINAL
removes pseudocapsule and lesion but leaves reactive zone
SURGICAL MARGINS

WIDE RESECTION

Tumor, pseudocapsule and reactive zone removed

TUMOR
SURGICAL MARGINS

RADICAL RESECTION

removing the entire compartment
basic principles

• all tumors spread along the path of least resistance
• benign lesions are entirely contained within the pseudocapsule
• HISTOLOGIC GRADE of sarcoma most important, not type!!
• ALL sarcomas have SATELLITES (cells in reactive zone and pseudocapsule)
• HIGH-GRADE sarcomas have SKIP lesions (intra-compartment mets) in addition to satellites
• ALL sarcomas can metastasize (lungs, occasionally lymph nodes)
BENIGN LESIONS

• MARGINAL EXCISION
BENIGN AGGRESSIVE TUMORS

GIANT CELL TUMOR
Extended intra-lesional curettage
(essentially a wide margin)
LOW GRADE SARCOMAS

MALIGNSANT CELLS IN PSEUDOCAPSULE AND REACTIVE ZONE SATELLITES

WIDE MARGIN

Low grade sarcoma
LOW GRADE SARCOMAS
Remember that the fascia is an excellent qualitative margin.
HIGH GRADE SARCOMAS

MALIGNANT CELLS IN PSEUDOCAPSULE AND REACTIVE ZONE

BUT ALSO OUTSIDE!!

SKIPS
HIGH GRADE SARCOMAS

WIDE MARGIN
INADEQUATE
ALONE

MISSES THE SKIPS!!
HIGH GRADE SARCOMAS

RADICAL MARGIN BEST BUT WITH SIGNIFICANT FUNCTIONAL LOSS
HIGH GRADE SARCOMAS

WIDE MARGIN MAY BE ADEQUATE WITH ADJUVANT THERAPY

RADIATION for soft tissue sarcomas
CHEMO for bone sarcomas
RADIATION THERAPY

• PRE-OP (50 Gy)
  • Less area needs to be radiated
  • Higher wound complications
  • I prefer for lesions with expected close margins

• POST-OP (65 Gy)
  • Greater radiated field to include hematoma
  • fewer acute wound complications, higher late
  • I prefer for ‘easy’ wide resections with low morbidity
High grade sarcoma... wide resection and radiation therapy