

Principles of Sarcoma Surgery

2nd Annual Wyckoff Mini-Medical School

Christian Ogilvie, MD

Associate Professor of Orthopaedic Surgery



UNIVERSITY OF MINNESOTA



Sarcoma Surgery

- Decision
 - Biopsy
- Planning
- Execution
- Follow-up



Decision

- Specific Pathology
 - Soft tissue sarcoma :surgery mainstay of treatment
 - Ewing's sarcoma: can get cure with chemotherapy and radiation
- Life expectancy
 - Time to recover and benefit
- Anatomy
 - Possible with acceptable morbidity



TWO Biopsy Principles

- 1. Don't burn bridges
 - May not be able to fix without altering optimal treatment course
- 2. Get diagnostic tissue
 - If not successful can be done again
- May be fewer complications if done at specialty center



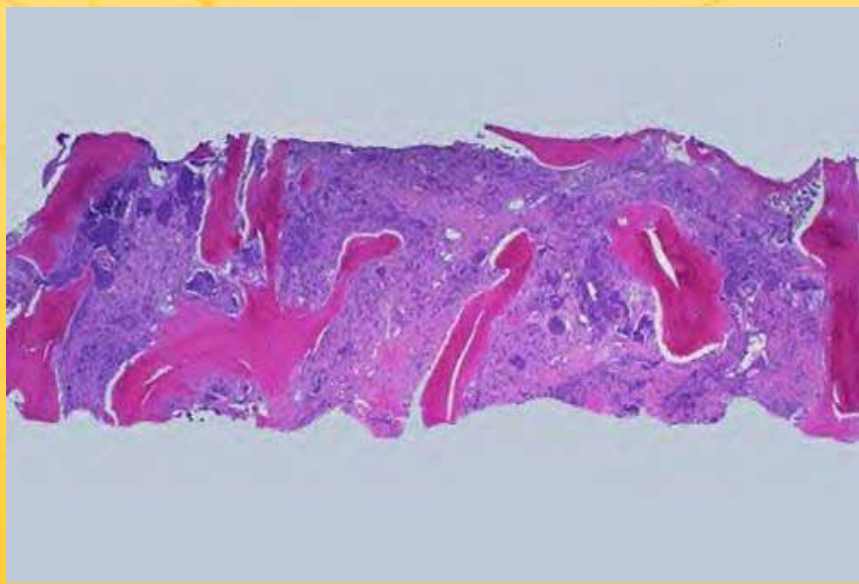
Biopsy Principles: Don't burn bridges

- Limit contamination of surrounding tissues
 - Small incision
 - Avoid undermining/flaps
 - Hemostasis
 - Go through muscle edge to contain field
 - Multilayer closure
 - Drain if needed: in line and close
- Incision along line used for resection
 - Extendable with minimal contamination of structures



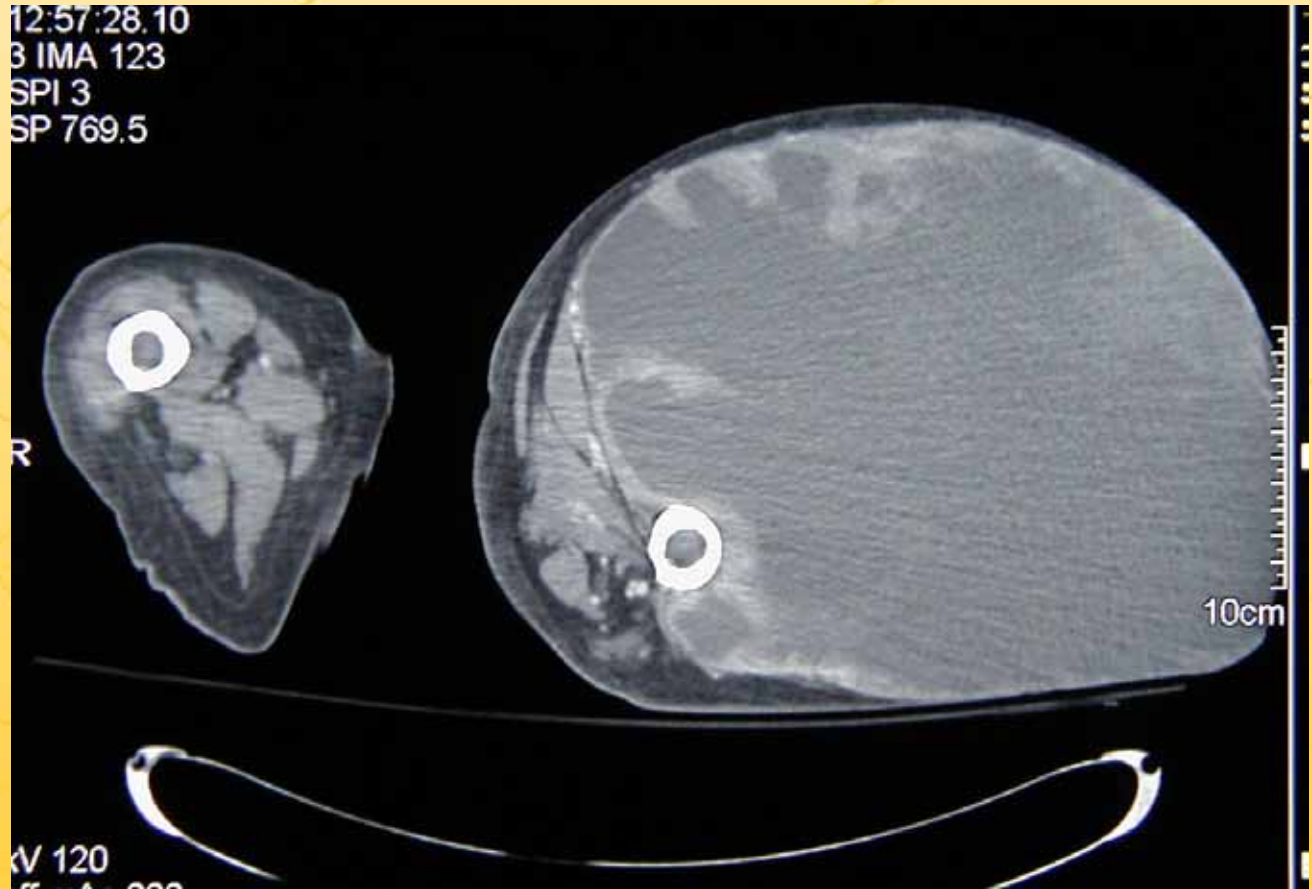
Biopsy Principles: Get Tissue

- Frozen section while in OR
 - Confirm that tissue is “diagnostic” (good quality, abnormal)
 - Not to get diagnosis immediately



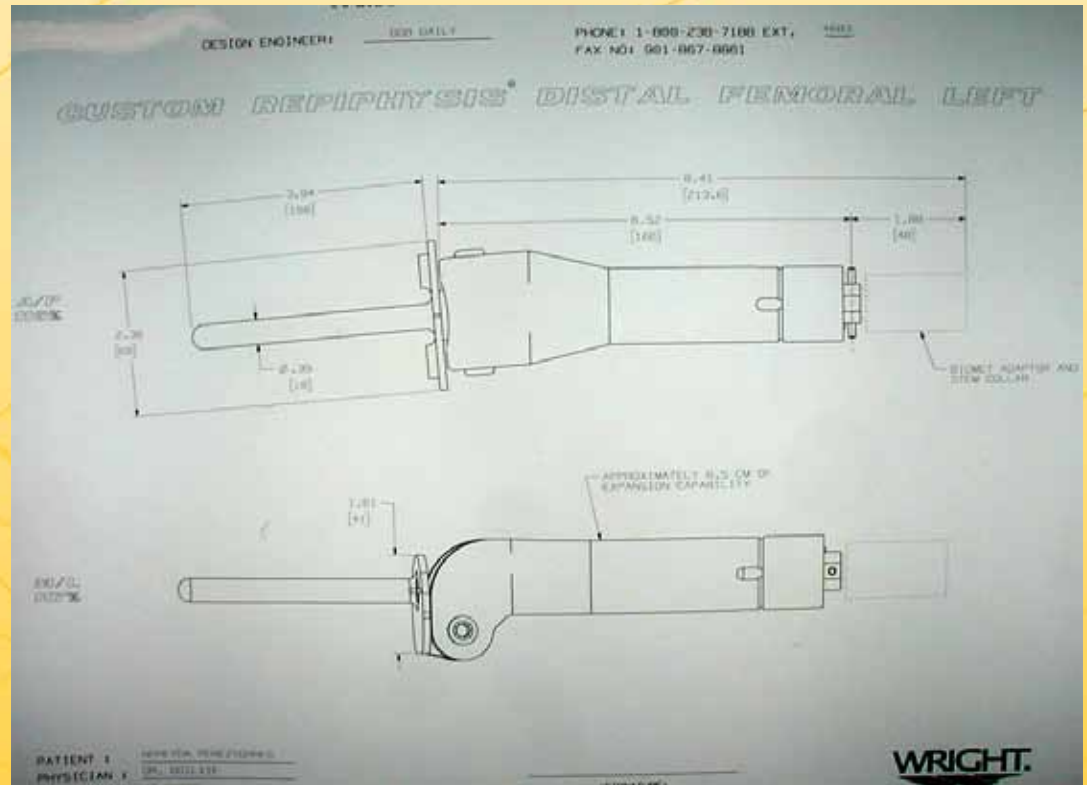
Sarcoma Surgery

- Decision
 - Biopsy
- Planning
- Execution
- Follow-up



Planning

- Timing
- Imaging
- Rehearsal
- Blood products
- Tumor removal
- Reconstruction



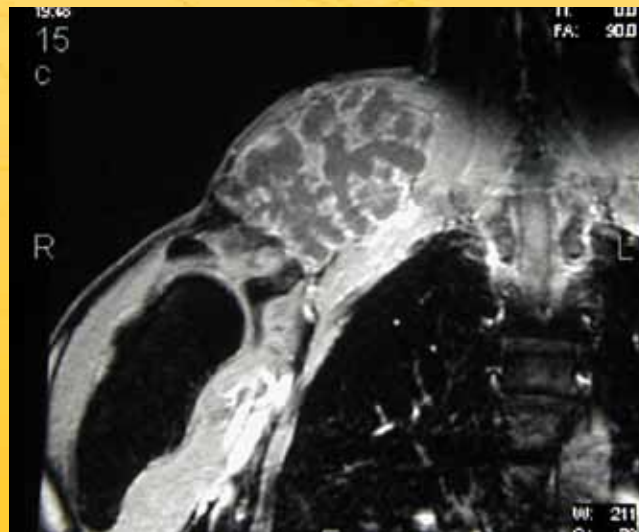
Planning: Timing

- Soft tissue sarcoma
 - Recovered from preoperative chemotherapy
 - Preoperative radiation
 - Surgery 2-6 weeks afterward
 - Get wounds healed in time for postoperative radiation or chemotherapy
 - Osteosarcoma: postoperative delay worsens prognosis



Planning: Imaging

- See entire extent of tumor, entire bone
- Look for landmark structures to judge extent of tumor interoperatively
- Decide what stays and what goes
- What structures must be moved



Planning: Tumor Removal

- Goal: removal with negative margins
 - Wide resection: normal tissue around tumor
 - Marginal: pseudocapsule exposed
 - Intralesional: inside tumor
 - No role in sarcoma surgery: rapid recurrence
- Decide where margins will be
 - What structures will stay with tumor



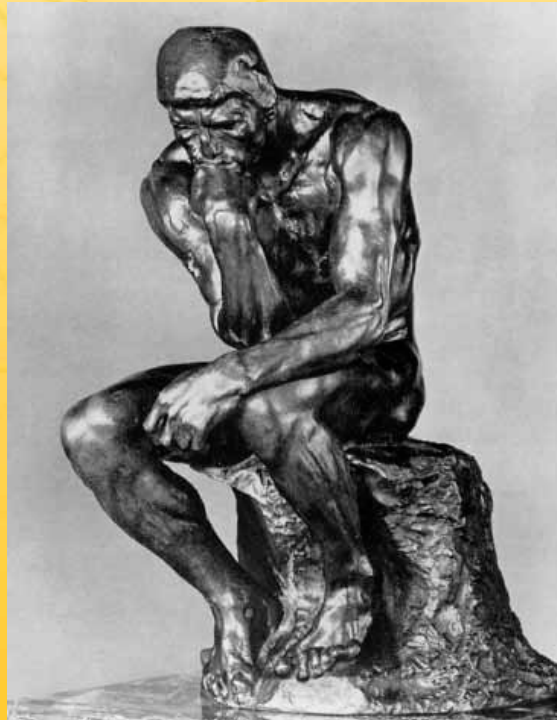
Planning: Reconstruction

- Bone
 - Endoprosthesis of appropriate size
 - Allograft available
 - Backup plan
 - Allograft breaks or does not fit
 - Fracture
 - Tumor size larger
- Soft tissues
 - Coverage: muscle flaps, skin graft



Planning: Rehearsal

- Rehearse surgery in your head several times
 - Address any new questions that arise
- Review subtle anatomy as needed



Planning: Blood Products

- Blood available if possible need
- Patient not taking blood thinners



Execution: Preparation

- Sterile technique
- Draw entire incision and possible extensions



Execution: Excision

- Avoid squeezing tumor
 - Manually or with elastic tourniquet
- Measure for bone cut
 - Usually 2 cm of marrow away from tumor
 - Consider more than 1 landmark
- Soft tissue margins
 - Some tissues better barrier than others
 - Greater needed for soft tissue sarcoma if radiation not planned



Execution: After Excision

- Irrigation
- Hemostasis
- Drains
 - If needed, place in line with incision
 - Close to end of incision
- Orient tumor
 - Suture in 2 spots helps pathologist know position
 - Insures margins are accurate



Execution: Reconstruction

- Bone
 - Measure specimen to decide on endoprosthesis
 - Trial endoprosthesis
 - Muscle balance
 - Position, rotation
 - Cover with muscle and skin graft as needed
- Skin
 - Avoid excessive tension especially if radiated



Follow-up

- Healing
 - 2 week check of incision, unless ...
 - Radiated: staples for 21 days
 - Motion and weight bearing according to strength of reconstruction
 - Wound drainage
 - Aggressive washout and antibiotics if allograft or prosthesis underneath
 - May be more conservative if good soft tissue below
- Physical therapy as needed



Thank you



UNIVERSITY OF MINNESOTA