

Bone Resection for Tumor

(3.2 Bone Tumor); Created October 21st, 2019, by Craig Zuppan, MD

SAMPLE DICTATION

(Labeled: ____, ____; ____) Received ____ is a ____ gram resection of distal femur [or other bone], that includes the [femoral condyles/tibial plateau/other] and overlying fat/muscle. The bone is about ____ cm long, ____ cm in diameter at the distal end, and ____ cm in diameter at the proximal end.

Major pathologic finding(s):

There is a tumor in the [location] [right/left] femur [or other bone] that measures about ____ x ____ x ____ cm externally, and is surrounded by skeletal muscle on the ____ aspect, and a thin [moveable/fixed] overlying fascia on the ____ aspect. The articular surface [describe/is not included]. Following sampling of margins and removal of the overlying soft tissues, the bone is serial sectioned in a [coronal / sagittal / cross-sectional / other] plane using a band saw, and the multiple resulting slabs show the underlying tumor to measure about ____ x ____ x ____ cm. The tumor is in the [part of the bone] about ____ cm from the distal [surgical margin/articular surface] and ____ cm from the proximal [surgical margin/articular surface]. Tumor penetrates the cortex in the ____ region, and replaces the overlying soft tissue. The soft tissue margins are [involved/closest] in the ____ regions [give distance], but elsewhere appear clear by about [give distance to margin on six dimensions, as relevant-proximal, distal, anterior, posterior, medial, lateral]. The cut surface of the tumor appears [solid/soft, homogenous/variegated, and (color)]. (If you are able to state whether the tumor appears necrotic or not, then do so, but this is often very difficult with bone tumors, especially osteosarcoma.)

Other findings:

The overlying soft tissue consists of unremarkable skeletal muscle, ranging from ____ to ____ cm thick on the [medial, lateral, etc] aspect, and elsewhere of a thin movable fascia 1 mm thick or less. The [distal and/or proximal] ____ cm of the bone is bare. On the lateral aspect there is also a ____ x ____ cm ellipse of skin with central scar, with about ____ thick underlying adipose tissue.

Specimen Handling: (RS, ____ caps). Ink Key: ____. Block Key: ____

SUGGESTED SAMPLING

Variable: Complete sample of one slab of bone tumor, often a sagittal slice (15 caps or so?), for determination of % necrosis. Mark out a section map on an image of the relevant slab, either on paper or digitally.

3-4 caps: Any other relevant areas of tumor with adjacent margins, tumor with different consistency, possible bone skip lesions, soft tissue invasion, etc.

1 cap: Marrow margin of bone ("shave"). If the cortical bone at the margin is very dense (it usually is), and if it is fairly clear grossly that it is not involved, you can generally core out the marrow from your shave of the bone margin and submit that, as it will section better without the rock-hard accompanying cortex.

1 cap for each relevant soft tissue margin

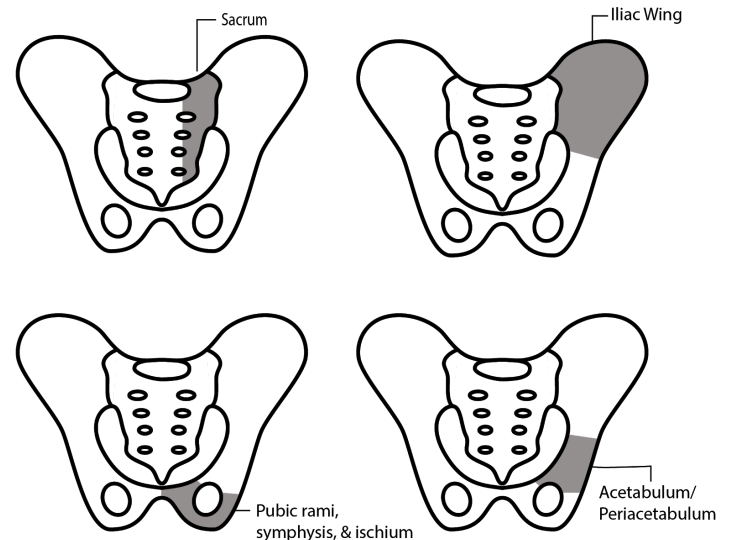
1-2 caps: Skin with scar, underlying biopsy tract in subcutaneous fat

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STAGING CRITERIA (AJCC 8TH EDITION)

- In **long bones**, facial bones and the skull, tumor size is the primary criterion for pT staging; discontinuous tumor foci in the bone upgrades the stage to pT3.
- In **vertebrae**, pT stage determination rests on the number of vertebral segments involved, and the number of vertebrae affected (see AJCC staging diagrams)
- In the **pelvis**, pT stage is complicated, and includes both tumor size, and the segment or segments of the pelvis that are affected (see diagram at right).
- pN status is determined by the presence or absence of regional node metastasis, with a special designator if tumor is only in a sentinel node (most of the time this will be pNX, as regional nodes are typically not included in the resection).
- pM status is determined by the presence of distant metastasis, and according to AJCC the pathologist will usually not assign an M status, unless metastasis is demonstrated in the pathologic material submitted for study.



ADDITIONAL CONSIDERATIONS

- This protocol **does not apply to resection of bone for metastatic tumor**, which is uncommon and usually a last-ditch effort at local control. For metastasis, simply describe what you got and submit sections to confirm tumor type and document any relevant margins.
- If at all possible, **show the case to a staff bone tumor pathologist**, for assistance in determining the sections to be taken for margins, the plane in which to section the bone, and how much to submit.
- **Do not place the resection specimen whole (uncut) in fixative for more than a few hours**, as the interior will not be penetrated by fixative. Whenever possible, try and sample margins and section the bone for fixation on the same day as submission from the OR, or if it arrives late, the following morning.
- Photographs of the cut surface are often very helpful.
- In some cases, the location of the tumor will not be evident externally, in which case you will need to refer to X-rays or imaging in the chart, and possibly obtain a **specimen X-ray**, to demonstrate where the tumor is and which margins are of most concern.
- In determining which plane to section the bone, try to choose the plane that best demonstrates the tumor and its relationship to the involved bone and surrounding soft tissues.
- Unless the bone is small, sectioning it into multiple slabs after you have stripped the soft tissue will likely require the use of the band saw in the morgue.
- The percentage of tumor necrosis must be determined on study of the microscopic sections of tumors resected after adjuvant therapy (which is just about the only time you will get a full tumor resection). This used to be important for treatment planning. It is now no longer used for treatment planning, but the pathology gods tell us we must still do this evaluation.
- The staging checklist asks for lymphovascular invasion (present or absent), which I rarely see.