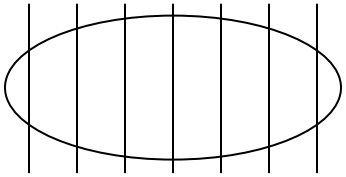
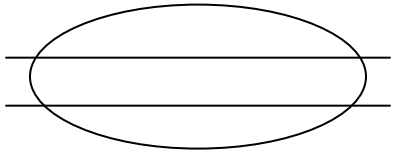
LYMPH NODE: BIOPSY

Guideline & Procedure: Lymph Node Biopsy (Discuss with hematopathology attending for lymphoma work up case prior to proceed to gross at LBJ)

1. Measure the specimen (three dimensions).
2. Dissect out the lymph nodes from the fat. Measure the smallest and largest lymph nodes. Examine the external surfaces for tumor and capsular defects.
3. Serially section the lymph nodes at 2-3 mm intervals parallel to the short axis (see below) if metastatic carcinoma is suspected or needs to be ruled out. It is acceptable to section lymph nodes longitudinally if lymphoma is suspected.



METASTATIC CARCINOMA WORK-UP



LYMPHOMA WORK-UP

4. The first priority is good formalin-fixed, paraffin-embedded, and H&E-stained sections. Frozen sections subsequently processed in formalin usually show cellular distortion and are not useful for diagnosis. If insufficient tissue is present (i.e., less than two blocks of tissue) do not freeze the tissue or send it for special studies. Perform touch preps (see below) and submit all the tissue in formalin for processing.
5. If the lymph node is received without fixative, determine whether the specimen is submitted for an infection work-up, a lymphoma work-up, both, or neither.
   a. Touch-preps: for all cases.
      i. Gently blot the cut surface of one of the slices, in order to remove blood or saline. Press a clean slide to the cut surface of the slice, at least 2-3 times on adjacent areas of the slide. Prepare a total of four slides in this manner. Fix two slides in alcohol and stain with hematoxylin-eosin or other stain as requested by the attending pathologist. Air-dry the other two slides and stain with DiffQuik stain. For lymphoma work up, prepare 5-7 extra unstained touch imprints slides if adequate tissue.
      ii. If the imprints are low in cellularity, you may gently scrape the cut surface of the slice for non-lymphoma work up case (only if there is adequate tissue for permanent sections) with a sharp blade, then smear out the scraped material onto a clean slide and stain as above.

b. Infection work-up: if infection is suspected clinically, following frozen section, or on gross examination.
    i. Microbiologic culture:
        1. Ideally, tissue for culture should be sent to microbiology directly from the operating room so that the tissue remains sterile until cultured. Remind the surgeon of this when you pick up the fresh tissue if he/she is suspecting an infectious process.
        2. If you must submit tissue from pathology sample for culture, use sterile technique. Take a small piece of tissue unless the specimen is very large. Indicate on the request form which studies (i.e. bacteria, fungi, AFB) are to be performed.
    ii. Special stains: consult with the attending pathologist whether to pre-order unstained slides or request special stains.
c. Lymphoma work-up: if leukemia or lymphoma is suspected clinically, following frozen section, or on gross examination. See Lymphoma Work-Up.

6. Fix the remainder of the specimen in formalin. If the specimen will sit in formalin before going into cassettes, it may be helpful to place each individual slice on a small piece of paper or paper towel to minimize curling. Discard the paper before submitting the tissue.
7. If the specimen is received in formalin, do not request special studies (exception: unstained slides or special stains).

Suggested Sampling for Histology: Lymph Node Biopsy

1. One to five sections, depending on the size of the lymph node. Include the capsule. Avoid submitting excessive fat.
2. Request thin H&E sections (3 µm-thick). Initiate 'lymphoma protocol' at LBJ
3. Request special stains and unstained slides depending on the case.

Dictation Template: Lymph Node Biopsy

Received without fixative/in formalin, labeled _____ and "_____", is a __ x __ x __ cm portion of yellow fibroadipose tissue containing __ (number) discrete/matted lymph nodes. The lymph node capsules are _____ (intact, inapparent). Each lymph node has a _____ (color, fleshy, bulging, soft, firm, multinodular, necrotic, hemorrhagic) cut surface. __ (number) touch preps are prepared and stained with _____ stain. Tissue is submitted for microbiologic culture and flow cytometry and is held for possible cytogenetic, and/or gene rearrangement studies. Representatively submitted for routine histology in __A-__E.

__ blocks, __ H&E, __ touch preps (__ Diff-Quik, __ H&E)

CPT Codes
Lymph node biopsy (not sentinel node and not lymphoma): 88305
Lymph node biopsy for lymphoma: 88307

LYMPHOMA WORK-UP

Guideline & Procedure: Lymphoma Work-Up (histologic section is the first priority, as same as other surgical specimens. Discuss with attending prior to proceed gross at LBJ)

1. Lymphoma work-up is preferred to be performed on unfixed ("fresh") tissue.
2. The tissue can be taken from any site/organ but most often is lymph node.
3. Touch-preps:

   Gently blot the freshly cut surface of the tissue, in order to remove blood or saline. Press a clean slide to the cut surface, at least 2-3 times on adjacent areas of the slide. Prepare a total of four slides in this manner. Fix one slide in alcohol and stain with hematoxylin-eosin or one with DiffQuick stain or other stain as requested by the attending pathologist. Air-dry the other5-7 slides as unstained slides if tissue adequate

4. Submit the representative section(s) for permanents. Request thin H&E sections and make the case as 'lymphoma protocol' on gross sheet at LBJ Immunohistochemistry: consult with the attending pathologist whether to pre-order unstained slides for immunohistochemistry studies.
5. Flow cytometry: submit tissue in RPMI or other cell culture medium for immunophenotyping. Flow cytometry is not necessarily helpful in the diagnosis of Hodgkin lymphoma, so consult with the attending pathologist before submitting tissue for such case.
6. Cytogenetic and/or gene rearrangement studies: submit extra tissue in RPMI or other cell cultures medium for cytogenetic study and/or gene rearrangement studies (discuss with the hemepath attending).
7. Fix the remainder of the tissue in formalin and submit as indicated for routine histologic sections.

SPLEEN: SPLENECTOMY

Guideline & Procedure: Splenectomy (Discuss with hematopathology attending for lymphoma work up case prior to proceed to gross at LBJ)

1. Measure (three dimensions) and weigh the specimen.
2. Examine the external surface for capsular defects or lacerations, especially at the hilum, and measure their length and depth. Note the overall shape of the spleen, nodularity, and capsular thickening/fibrosis/granularity/adhesions.
3. Identify accessory spleens, lymph nodes, and vessels in the hilum. Weigh accessory spleens. Serially section accessory spleens and lymph nodes and examine the cut surfaces.
4. If infection is suspected clinically, see 6.b.i. below before sectioning the specimen.
5. Serially section the spleen across the short axis in the unfixed (or minimally fixed) state, at 1.0 cm intervals if removed incidentally or for trauma and at 0.5 cm intervals if removed for disease. Examine the cut surface for nodules, fibrosis, infarcts, and other lesions and measure these, where appropriate. Describe the overall cut surface (color, consistency). Palpate each slice individually for nodules if lymphoma is suspected clinically.
6. Determine the need for special studies or procedures:
    a. Touch preps: to be performed in all cases of suspected disease (i.e. not incidental or traumatic spleen).
        i. Gently blot the freshly cut surface of the tissue, in order to remove blood or saline. Press a clean slide to the cut surface, at least 2-3 times on adjacent areas of the slide. Prepare a total of 7-9 slides in this manner (discuss with attending). Fix two slides in alcohol immediately and later stain with hematoxylin-eosin or other stain as requested by the attending pathologist. Air-dry the one slides and stain with DiffQuik stain. Keep rest of slides for future studies as needed.
        ii. If the imprints are low in cellularity, you may gently scrape the cut surface of the slice with a sharp blade, then smear out the scraped material onto a clean slide and stain as above.
    b. Microbiologic culture: unfortunately, the specimen will probably already be contaminated, since spleens are submitted in large, unsterile containers. Nonetheless, try to prevent further contamination.
        i. If infection suspected clinically: using sterile technique, take a piece of tissue before serially sectioning the specimen. Take your sample from nodules or other suspicious areas seen externally, if possible. If no suspicious areas are identified, take a random section. Serially section the specimen in as sterile a manner as is possible and submit additional tissue if lesions are identified. Indicate on the request form which studies (i.e. bacteria, fungi, AFB) are to be performed.

ii. If infection is suspected on frozen section or gross examination: using sterile technique, take tissue from the interior (previously-unsectioned part) of a suspicious area, if possible, since this will be the least contaminated. Fill out the request form, as above.

c. Special stains or immunohistochemistry studies: consult with the attending pathologist whether to pre-order unstained slides or request special stains.

d. Lymphoma work-up: to be performed if leukemia or lymphoma is suspected clinically, following frozen section, or on gross examination. See Lymphoma Work-Up.

e. Sickle cell disease: as soon as the specimen is received, cut a block of tissue (2x2x1 cm) and place it in formalin.

7. Take photographs, if indicated.

Suggested Sections for Histology: Splenectomy

1. Non-diseased spleen (i.e. incidental or traumatic): two (if incidental) to three (if traumatic) sections. Including capsule in all sections. Include capsular lacerations in two blocks, if present.
2. Spleen for lymphoma work-up: sample all nodules, up to ten sections, regardless of small size. Include hilum in one section and capsule in two sections. Request thin H&E sections (3 µm-thick). Refer to LYMPH NODE section for detail lymphoma work up. Call attending if questions.
3. Spleen with other disease: at least five sections. Include lesions in multiple sections, hilum in one section, and capsule in at least two sections.
4. Accessory spleens: one to two sections per accessory spleen, depending on size, if present.
5. Lymph nodes: entirely submit. There is no need to submit hilar adipose tissue or vessels if lymph nodes are not identified.

Dictation Template: Splenectomy

Received without fixative/in formalin, labeled _____ and "_____", is a __ g, __ x __ x __ cm spleen. The capsule is _____ (color, texture, thickened, adhesion-covered) and has a __ cm laceration with surrounding hemorrhage not/extending to the hilum which continues into the splenic parenchyma for a depth of __ cm. There is a __ g, __ x __ x __ cm accessory spleen in the hilum. It has a _____ capsule and a _____ cut surface. A __ x __ x __ cm lymph node with a _____ cut surface is also in the hilum. The splenic cut surface is _____ (color, consistency, fibrosis), with __ (number)/multiple _____ (color, consistency, necrosis) nodules/peripheral infarcts, ranging from __ to __ cm in diameter. Touch preps are prepared. Photographs are taken. Tissue is submitted for microbiologic culture/flow cytometry/cytogenetic/gene rearrangement studies. Representatively submitted as follows:

__A-B = capsular laceration
__C-G = nodules
__H = accessory spleen

__I = one lymph node, bisected

__ blocks, __ H&E, __ touch preps (__ Diff-Quik, __ H&E)

CPT Codes
Spleen splenectomy: 88305

BONE MARROW: CORE BIOPSY

Guideline & Procedure: Bone Marrow Core Biopsy

1. Count the number of fragments.
2. Measure (length x diameter) each fragment.
3. Describe the specimen (color, consistency, shape, approximate percent of the specimen appears to be cortical bone vs. bone marrow).
4. Allow ***adequate time*** for formalin fixation prior to decalcification and processing (decal time: a few hours).
5. Describe any marrow clot sample.

Suggested Sections for Histology: Bone Marrow Core Biopsy

1. Entirely submit all tissue after decalcification.
2. Submit all marrow clot sample as separate block.

Dictation Template: Bone Marrow Core Biopsy

Received without fixative/in formalin/in _____ solution, labeled _____ and "_____", is a cylindrical core biopsy of bone measuring __ cm in length x __ cm in diameter. There is __ cm of _____ (color) cortical bone at one end and __ cm of _____ (color) bone marrow at the opposite end. Entirely submitted core biopsy in __A after decalcification, and bone marrow clot section as B.

__ blocks, __ H&E, __ decal

CPT Codes
Bone marrow biopsy: 88305
Decalcification: 88311

LYMPH NODE: SENTINEL LYMPH NODE BIOPSY

Guideline & Procedure: Sentinel Lymph Node Biopsy

1. Measure the specimen (three dimensions).
2. If the lymph node is > 0.5 cm, serially section it into 0.15 - 0.2 cm slices parallel to the longitudinal axis (as you would for a metastatic carcinoma work-up). If the lymph node is < 0.5 cm, bisect it.
3. Describe the cut surface (color, consistency, presence of blue dye), paying particular attention to areas suspicious for tumor.
4. If interoperative consultation is requested by the surgeon, proceed as follows:
   a. If a focus suspicious for tumor is present: perform touch preps as described above frozen section on the slice containing that focus.
   b. If no suspicious focus is present: perform touch prep frozen section on one representative slice.
5. Fix in formalin.

Suggested Sections for Histology: Sentinel Lymph Node Biopsy

1. Entirely submit.
   a. Request 5 levels on each block – H&E on levels 1, 3 and 5 and unstained on levels 2 and 4 (to be held in reserve in case immunohistochemistry studies are needed).

Dictation Template: Sentinel Lymph Node Biopsy

Received without fixative/in formalin, labeled _____ and "_____", is a __ x __ x __ cm lymph node. The lymph node capsule is _____ (intact, inapparent). It has a _____ (color, fleshy, bulging, soft, firm, multinodular, necrotic, hemorrhagic) cut surface focally stained with blue dye, with a __ cm focus suspicious for tumor. Touch preps are made. Tissue are eEntirely submitted as follows:

FS__A = suspicious focus; __B-__C = remainder of tissue.

__ blocks, __ H&E, __ frozen section

TONSILS AND ADENOIDS: TONSILLECTOMY/ADENOIDECTOMY

Guideline & Procedure: Tonsillectomy and Adenoidectomy

Tonsils and adenoids are commonly removed in children with chronic infections and in individuals of any age with sleep apnea. Under these circumstances, gross abnormalities are not usually observed; however, adult specimens require close gross examination for mucosal irregularities (which could represent squamous dysplasia or carcinoma) or a fleshy cut surface (which could represent lymphoma).

Count the number of tissue pieces per container and identify each piece as tonsil or adenoid. Determine whether any orienting marks (e.g. sutures) are in place to distinguish left vs. right.

Measure each piece (three dimensions).

Describe the external surfaces (color, cerebriform, smooth, rough, presence of yellow granules). If tumor is present, ink the resection margin and describe and measure the tumor. See Lymphoma Work-Up if lymphoma is clinically or grossly suspected.

Serially section each piece and describe the cut surfaces (color, homogeneous, necrotic, hemorrhagic, presence of yellow granules). If tumor is present, sectioning should be done perpendicular to the resection margin. Determine the degree of involvement of the cut surface by tumor.

Suggested Sections for Histology: Tonsillectomy and Adenoidectomy

Routine tonsils and adenoids: one cross-section per tonsil and adenoid.

If tumor suspected: minimum of three cross-sections in suspicious pieces.

Dictation Template: Tonsillectomy and Adenoidectomy

Received without fixative/in formalin, labeled _____ and "_____", are three soft tissue fragments, measuring __ x __ x __ cm, __ x __ x __ cm, and __ x __ x __ cm, respectively. The largest two represent tonsils and the smallest one represents adenoids. All

fragments have a _____ (color) cerebriform outer surface which is rough along the resection margin. The cut surfaces are _____ (color) and homogeneous, with/without focal yellow granules within the craters. Representatively submitted.

__A = larger tonsil

__B = smaller tonsil

__C = adenoids

__ blocks, __ H&E