**Purpose**

To establish a set of procedures on how to dissect and gross intact and fragmented fetal remains. All fetal remains under 27 weeks (end of 2nd trimester) will be processed in the CW frozen lab. Any remains over 27 weeks will be processed in the morgue.

**Materials**

* All clinical information including ultrasound reports found in MiChart.
* String or measuring tape.
* Stillbirth weight and measurement tables.
* Langley maceration tables.
* Fetal weights and measurements documentation form.

**Procedure**

**INTACT FETUSES AT ANY GESTATIONAL AGE:**

1. Perform external gross examination looking for dysmorphic features.
2. Take photographs for full body and close up for face including lateral views.
3. Get the external measurements (weight, length, head circumference, etc.) and correlate with the expected for gestational age (see tables below) and fill out weights and measurements documentation form (see below).
4. Using the Y shape incision, open the chest and abdomen and try to identify all internal organs and assess their size, position and presence of any malformations.
5. Take photographs for chest and abdomen in situ and document all abnormalities.
6. Dictate summary of clinical history and gross findings in Winscribe by using appropriate template (see below).
7. Submit representative sections from all organs following fixation.
8. In rare cases additional ancillary studies may be needed or requested by the clinicians, like karyotype, cultures and fetal x rays in skeletal dysplasia cases.
9. Brain examination may be done at the time with the pediatric pathology attending or may be referred to neuropathology service in selected cases.
10. Make sure the placenta goes to the faculty signing out the exam.

**FRAGMENTED FETUSES AT ANY GESTATIONAL AGE:**

1. Separate placental fragments from fetal parts.
2. Examine fetal parts carefully (magnifiers might be helpful) for external and abnormal abnormalities correlating with the ultrasound findings
3. X rays are required in all cases of skeletal dysplasia and other bony abnormalities seen on ultrasound (see separate Master Control Document, “Fetal X-Ray Procedure”.
4. Photograph placental and fetal parts separate and obtain close views of recognized abnormalities
5. Dictate the summary of clinical history and gross findings in Winscribe by using the appropriate template (see below).
6. Get the external measurements (weight, foot length, etc.) and correlate with the expected for gestational age (see tables below) and fill out weights and measurements documentation form (see below).
7. State the status of all recognizable and evaluable organs and mention which parts or organs are not evaluable due to the procedure (don’t use terminology such as disruption or deformation to describe artifacts related to the procedure; instead use missing, damaged, or fragmented).
8. Try to differentiate fetal sex based on external examination (take a picture) and identify gonads. Testis can be found retroperitoneal adjacent to the kidney down to the inguinal canal or scrotum in older male fetuses. Ovaries are usually present in the pelvis attached to a small uterus in the midline. If no external genitalia or gonads are recognized due to fragmentation, take all tissue in the pelvis behind the pubis from midline and both sides including bladder and rectum.
9. If the heart is intact, try to identify all chambers and major vessels. Take close up pictures to show two atria, two ventricles and two large vessels at the base from both sides anterior and posterior before opening the heart. Open following blood flow (when size is reasonable) to evaluate valves, atrial and ventricular septum. Take pictures to demonstrate inflow and outflow tracts of each ventricle in addition to the septum if there is a defect. If the heart is too small to open, take external close up pictures to demonstrate all chambers and major vessels before separating from the lungs if attached. Take cross sections starting just below the atrioventricular junction, another one below and one up. Place the sections serially and take a close up picture.
10. Submit sections from all recognizable organs
11. Weight placental fragments in aggregate. Describe membranes, umbilical cord and placental parenchyma and submit at least three sections

**Sections for Histology:**

* Tissue from all identifiable organs should be submitted including eyes from fragmented fetuses.
* If neurological abnormalities are suspected such as neural tube defects, take cross sections of the spine around the defect to include skin, underlying soft tissue, vertebrae and spinal cord.
* In cases with vertebral bony abnormalities, take longitudinal sections of the affected vertebrae.
* In cases of skeletal dysplasia, take sections of the ribs and the entire femur.
* If there is bony abnormalities described in the extremities, take sections of the affected area.

**GROSS DICTATION TEMPLATES**

**Intact**

A. Received fresh is the body of an intact fetus.

The body is that of an intact \_\_ with Langley grade \_\_ maceration. Body measurements are as follows: weight \_\_ grams (expected mean for gestational age \_\_ grams), head circumference \_\_ cm, crown-rump \_\_ cm (expected mean for gestational age \_\_ cm), crown-heel \_\_ cm (expected mean for gestational age \_\_ cm), chest circumference \_\_ cm and abdominal circumference \_\_ cm. The right and left feet are \_\_ cm each (corresponds with a gestational age \_\_ weeks).

The scalp has marked edema. The head has a normal shape with overlapping of the cranial bones. The inner canthus distance is \_\_ cm; the outer canthus distance is \_\_ cm. The nares are probe patent. The lip and palate show no cleft deformity. The tongue is unremarkable. The ears are normally rotated and positioned. The neck has no cystic hygroma. The thorax is unremarkable. The abdomen has an attached \_\_ cm of umbilical cord stump. The genitalia are those of a \_\_ and normally developed. The anus is patent. The upper and lower extremities each have five digits, bilaterally with no polydactyly, syndactyly, or clinodactyly. The palmar creases are normal. The feet have no club or rocker bottom deformities.

In Situ Examination:

In situ examination of the thorax and abdomen shows the organs have a normal situs. The right and left pleural cavities contain approximately \_\_ ml of red serous fluid each. The pericardial sac is intact and contains approximately \_\_ ml of red serous fluid. The diaphragmatic leaflets are intact. The peritoneal cavity contains minimal serous fluid. The internal organs are macerated.

Internal Examination:

The thymus is \_\_ grams (expected mean for gestational age \_\_ grams) and is composed of tan parenchyma. The heart is \_\_ grams (expected mean for gestational age \_\_ grams). The apex is towards the left. The great vessels have a normal position and morphology. There is atrial situs solitus. The superior and inferior vena cava enters the right atrium. The foramen ovale is patent. The foramen ovale is patent. The valves are normally developed. The ductus arteriosus is patent. There are no atrial or ventricular defects identified. The aorta and pulmonary arteries have a normal configuration. The pulmonary venous return has a normal configuration. The aorta is left side and has a normal branching pattern. The lungs have a combined weight of \_\_ grams (expected mean for gestational age \_\_ grams). The right lung has three lobes; the left lung has two lobes. The pleural surfaces are pink and smooth.

The esophagus and trachea have no trachea-esophageal fistula. The intestines have a have a normal rotation. The stomach, small intestine and colon are unremarkable. The liver is \_\_ grams (expected mean for gestational age \_\_ grams). The parenchyma has has brown, soft parenchyma. The extra hepatic biliary tree cannot be assessed due to maceration. The pancreas has tan-red parenchyma. The spleen is \_\_ grams (expected mean for gestational age \_\_ grams). The parenchyma is dark red and diffluent. The right and left adrenal glands have a combined weight of \_\_ grams (expected mean for gestational age \_\_ grams). The kidneys have a combined weight of \_\_ grams (expected mean for gestational age \_\_ grams). The parenchyma is brown and has distinct cortical medullary junctions. The collecting systems are not dilated. The ureters drain into the urinary bladder. The uterus, ovaries and fallopian tubes are unremarkable.

The brain is \_\_ grams (expected mean for gestational age \_\_ grams). The parenchyma has a normal gyration pattern for age \_\_. The parenchyma is tan-red and soft with loss of anatomic structures.

Cassette Summary:

**Fragmented**

A. Labeled with patient's name and number. Received in formalin in a medium container is an extensively fragmented fetus with identifiable placenta parenchyma.

The body is that of an extensively fragmented fetus with a \_\_\_ degree of maceration. The overall weight of all the fetal parts is \_\_\_ grams in aggregate. Foot length \_\_ cm on the right and \_\_ cm on the left (corresponds with gestational age of \_\_ weeks). Other body measurements cannot be given due to fragmentation.

The head is fragmented. The inner canthus measurement is \_\_ cm and the outer canthus measurement is \_\_ cm. The ears are \_\_\_\_ normally set and rotated / low set and posteriorly rotated, however accuracy of positioning is difficult to determine due to fragmentation of the skull. The nares are / are not probe-patent. The lips and palate show no evidence of cleft / appear \_\_\_. The tongue is \_\_\_. The external examination of the neck, thorax and abdomen is difficult to assess due to specimen fragmentation. Examination of the perineum shows male genitalia. The anus is patent / not patent. Examination of the upper and lower extremities shows a number of five digits, bilaterally, on the upper and lower extremities. The upper and lower extremities are grossly unremarkable without fused digits or other defects. The palmar creases are unremarkable.

Multiple unremarkable fragmented organs are identified \_\_\_\_. The following organs not identified grossly \_\_\_\_. There is an area of soft tissue surrounding the \_\_\_ (possible \_\_\_\_), measuring \_\_ x \_\_ x \_\_ cm.

The heart is predominantly intact, and weighs \_\_ gram. Opening of the heart shows a normal configuration / \_\_\_. One great vessel is identified and is fragmented. It is bisected at the base, and the septum appears intact.

Fragmented placenta:

Also present in the container are multiple irregular tan-pink soft tissue fragments, admixed with dark red-brown, soft clotted blood, \_\_\_ grams and \_\_ x \_\_ x \_\_ cm in aggregate. Decidua is / is not identified. The possible fetal surface has a \_\_\_ appearance, with grossly unremarkable tan, spongy underlying parenchyma / \_\_\_lesions/infarcts/throbin/fibrin. Defined vessels and possible villous tissue are / are not identified.

The attached umbilical cord has a \_\_\_, hyopcoiled / normal coiled / hypercoiled appearance and measures \_\_ cm in length x \_\_ cm in diameter. No true or false knots identified / # pseudo knots / true knots identified. Upon sectioning, # vessels are identified.

Cassette summary:

**Langley Maceration Grading Scale**

|  |  |  |
| --- | --- | --- |
| **MACERATION**  **(Langley)** | | |
|  | GRADE | DESCRIPTION |
|  | Fresh Stillborn - None | None of the changes below noted |
|  | Grade 0 | Parboiled reddened skin |
|  | Grade 1 | Skin slippage and peeling |
|  | Grade 2 | Extensive skin peeling  Serous effusions in chest and abdomen |
|  | Grade 3 | Organ softening  Collapse of cranial bones  Sunken eyes/yellow-brown liver  Turbid effusions  May be mummified |

**Fetal Weights and Measurement Tables**





Requisition sticker

**Fetal Exam Documentation Form**

* Langley Maceration Grade:\_\_\_\_\_\_\_\_\_\_\_\_
* Body Weight: \_\_\_\_\_\_\_\_\_\_\_\_grams
* Foot Length: L\_\_\_\_\_\_\_\_\_\_\_cm / R\_\_\_\_\_\_\_\_\_\_\_ cm
* Head Circumference: \_\_\_\_\_\_\_\_\_\_\_cm
* Crown Rump Length: \_\_\_\_\_\_\_\_\_\_\_cm
* Crown Heel Length: \_\_\_\_\_\_\_\_\_\_\_cm
* Chest Circumference: \_\_\_\_\_\_\_\_\_\_\_cm
* Abdominal Circumference: \_\_\_\_\_\_\_\_\_\_\_cm
* Inner Canthal Distance: \_\_\_\_\_\_\_\_\_\_\_cm / Outer Canthal Distance: \_\_\_\_\_\_\_\_\_\_\_cm
* Gender: M / F
* Organ Weights:
  + Thymus\_\_\_\_\_\_\_\_grams
  + Brain\_\_\_\_\_\_\_\_grams
  + Heart\_\_\_\_\_\_\_\_grams
  + Lungs (combined) \_\_\_\_\_\_\_\_grams
  + Liver\_\_\_\_\_\_\_\_grams
  + Spleen\_\_\_\_\_\_\_\_grams
  + Pancreas\_\_\_\_\_\_\_\_grams
  + Kidneys (combined)\_\_\_\_\_\_\_\_grams
  + Adrenals \_\_\_\_\_\_\_\_grams,
* Placenta Weight: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_grams/ Umbilical Cord Length:\_\_\_\_\_\_\_\_\_\_\_cm

**Additional Notes:**