

FINAL ANATOMIC DIAGNOSES:

1. Massive injury to the head characterized by:
 - A. Scalp lacerations.
 - B. Extensive fracturing, much of which is comminuted with associated fracture fragments, skull.
 - C. Entrance wound, roof of mouth with fracturing and lacerations of the hard and soft palates.
 - D. Cavitory defect in the top of the skull, also involving the right and left parietal and temporal areas representing an exit wound.
 - E. Fractures to the facial bones.

2. Fractured neck involving C1 and C2 with transection of the spinal cord.

COMMENT: The autopsy findings in this case indicate that the cause of death is due to massive head injury secondary to blunt force trauma sustained from a through-and-through shotgun wound involving the mouth and an exit wound involving the upper posterior aspect of the left side of the head. A positive scientific identification was established with DNA technology.

Ben Galloway M.D.
Ben Galloway, M.D.

This autopsy is performed in the Clear Creek County Coroner's Office in Idaho Springs, Colorado on April 19, 2019. The examination was initiated at 10:00 a.m. and continued for three hours, concluding at 1:00 p.m. This autopsy is done at the request of Chris Hegmann, the coroner of Clear Creek County. Mr. Hegmann attended the autopsy, assisted me in the autopsy, and identified the decedent to me. Additional identification is by provided by a tag encircling the right wrist bearing the name "Sol Pais." Shawna Gilbert, the lead investigator in the case also attended the autopsy.

HISTORY: This is the case of an 18-year-old white female who was discovered at the trail head off the grounds of the Echo Lake Lodge slightly off the trail, the apparent victim of a shotgun wound involving the oral cavity. Permanent identification is by personal effects and a passport picture. Scene investigation revealed the presence of a shotgun between her legs, personal effects, and a duffle bag. No significant past medical history is available at the time of autopsy. The discovery date was April 17, 2019.

EXTERNAL EXAMINATION: The body is clothed in a long sleeved, blue, gray, and tan flannel plaid shirt bloodstained on the left shoulder. This is consistent with the position of discovery, which is on the decedent's left side. The body was also clothed in black pants with a black belt with some tissue attached to the upper right thigh; long sleeve black shirt; black boots; two types of stockings; one of which is a knee-length black sock, the other connected pair consisting of black panties; black hose; black socks, and black lace, brief-type panties. Black gloves with exposed fingers are present on each hand. This is the unembalmed, well-developed, well-nourished body of a white female appearing consistent with the stated age of 18. Height is measured at 5'5"; weight is estimated at 100-110 pounds. Rigor is trace in the neck; 1+ in the upper extremities; and 2+ in the lower extremities. Reddish-purple livor is well set over the dorsal left lateral surface of the body with blanching at the pressure points. There is also irregular cherry-pink livor involving the anterior surface of the pelvis and irregular cherry-pink livor involving the lower extremities.

HEAD: The normal configuration of the head is markedly distorted by injuries compatible with a gunshot wound. The scalp is covered by bloodstained, long black hair measuring 12" in length. Palpating the head reveals extensive instability due to widespread fracturing. Ears – the right ear is pierced and contains a pierced silver-colored earring. The left ear is pierced, bloodstained, and contains no earring. Eyes – the eyebrows are black. Bilateral periorbital contusions involve both eyes. Small medial lacerations involve the medial surfaces of both eyes, one involving the right eye, which is 1/4" in length; two involving the left eye, the largest of which is 1/4". The sclerae are white. The right iris is gray. The left iris is brown. The pupils are round, measure 5 mm, and are directed anteriorly. The conjunctivae reveal mild congestion on the left and paleness on the right. No petechiae are observed. Nose – the nose is externally unremarkable; on palpation, there are fractures of the nasal bones. The nasal passages contain blood. I can palpate fractures of the left orbit and the face. Mouth – the lips are reddish-purple. Lacerations are present, horizontally oriented at the corners of both sides of the mouth. The laceration on the right is 1/2". The laceration on the left measures 3/16". The mucosal surface of the lower lip demonstrates scattered abrasions and lacerations. Some of the lacerations are punctate. The oral mucous membranes are tan and bloodstained. The tongue is reddish-brown and shredded. There are fractures of the upper alveolar ridge and broken teeth. The roof of the

mouth demonstrates lacerations and fractures involving the hard and soft palates. Hemorrhagic fluid is present in the oral cavity. I can palpate fractures of the mandible.

NECK: The external surface of the neck reveals no evidence of external injury. The neck organs are in the midline without palpable masses.

CHEST: The chest demonstrates a normal anterior-posterior diameter. There is no external evidence of injury. The breasts are well developed and moderate size without evidence of external injury or palpable masses. Palpating the chest reveals no instability or crepitus. The axillae are negative to observation and palpation.

ABDOMEN: The abdomen is flat. There is no external evidence of injury. There is no evidence of previous surgical exploration.

GENITALIA: The pubic hair has been previously shaved and black stubble remains. The labial folds are intact without evidence of external injury. The introitus is intact without evidence of injury. The hymenal ring is intact. No injuries are observed in the vaginal vault. The perineum is intact and unremarkable.

BACK: The external surface of the back reveals cherry-pink livor irregularly distributed on the posterior left lateral surface of the back. Incision and dissection of the posterior cervical spine and upper thoracic posterior spine reveals no evidence of soft tissue injury or musculoskeletal injury. There is no surface external injury to the back. The anus is intact without any unusual dilatation or trauma.

EXTREMITIES: Upper extremities - the upper extremities are intact. The span of the upper extremities is as follows: the right measures 29-1/4" from the tip of the shoulder to the tip of the index finger of the right hand. The span of the left upper extremity likewise measures 29-1/4" from the left shoulder to the index finger of the left hand. Hands - some black fingerprint ink covers the fingers and palms of the hands. The nails are intact and vary from moderate length to long. The fingernails are clean. A black watch is clasped and encircles the left wrist. The forearms are unremarkable. The antecubital fossae reveal no evidence of recent needle puncture marks or scars. The upper arms are intact and unremarkable grossly. No individual distinguishing marks for identification involve the upper extremities. No tattoos are present. Lower extremities - the lower extremities are intact without evidence of congenital abnormality or trauma. No tattoos are present. The toenails are short and slightly dirty. The soles of the feet are intact and unremarkable grossly.

INTERNAL EXAMINATION: Through the usual Y-shaped incision, a thin layer of pale-yellow subcutaneous adipose tissue and reddish-brown musculature are revealed. The diaphragms are intact and arch to the level of the 5th left intercostal space and the 4th right intercostal space. The peritoneal cavity contains no unusual accumulation of fluid. The lining is smooth, gray, and glistening. The viscera and omentum are normally disposed.

PLEURAL SPACES: The pleural spaces are without any unusual accumulation of fluid. The parietal pleurae are smooth, gray, and glistening. The bony structures of the chest are intact and

unremarkable grossly. There is no soft tissue hemorrhage in the anterior chest wall. The pericardial sac is intact. The lumen contains 5 cc of clear fluid. The pericardium is smooth, gray, and glistening.

THYMUS: The thymus is atrophic and replaced by a broad apron of fibroadipose tissue.

NECK ORGANS: The lumen of the upper esophagus and pharynx is patent. The mucosal surface is tan and wrinkled. The wall is thin. The lumen of the upper respiratory tract is patent. The mucosal surface is hyperemic and smooth. The hyoid bone and cricothyroid cartilages are intact. The thyroid is of normal size, shape, and position, and has a reddish-purple, lobular, firm gross appearance. Cervical vertebrae – there are fractures of C1 and C2. Minimal soft tissue hemorrhage is present. There is no obstruction to the posterior nasopharynx or the posterior aspect of the oral cavity. There is no soft tissue hemorrhage in the upper neck.

HEART: The heart is intact and weighs 200 grams. The epicardial surface is reddish-brown, smooth, and glistening. There is moderate epicardial yellow fat. The myocardium is reddish-brown and firm without gross evidence of fibrosis or softening. The left ventricle measures 1.7 cm; the interventricular septum measures 1.5 cm; and the right ventricle measures 5 mm in thickness. The endocardial surface is reddish-brown, smooth, and glistening. The cardiac valves are intact. The valve leaflets are thin and fully pliable. The tricuspid valve is bicuspid. The valve leaflets are thin, fully pliable, and delicate. The valve circumferences are as follows: the tricuspid valve measures 9.5 cm, the pulmonic valve measures 6 cm, the mitral valve measures 7.5 cm, and the aortic valve measures 5 cm. The chordae tendineae are tan and delicate, and appropriately attached to the valve margins. The foramen ovale is closed. The atrial septum is intact. The coronary sinus is patent. The ventricular septum is intact. The coronary ostia are in a normal anatomic position and widely patent. The coronary arteries demonstrate a normal anatomic distribution. Serial sections reveal small coronary arteries that are widely patent with otherwise normal gross features.

AORTA: The aorta is intact and of normal course and calibre throughout. The intimal surface is yellow-tan and smooth. The ductus is closed. The main abdominal tributaries are intact.

RESPIRATORY SYSTEM: The lumen of the lower respiratory tract is patent. The mucosal surface is tan and smooth. The lungs are moderately well aerated. The pleural surfaces are cherry-pink and smooth. The lungs together weigh 300 grams. Serial sections reveal soft, spongy lung tissue showing vascular congestion and early pulmonary edema. The pulmonary arteries are intact without evidence of thromboembolic disease. The pulmonary veins empty into the left atrium in a normal fashion.

GASTROINTESTINAL SYSTEM: The esophagus is of normal course and calibre throughout. The lumen is patent. The mucosal surface is tan with longitudinal furrowing. The wall is thin. The stomach is in a normal anatomic position. The lumen contains no gastric contents. There is a small amount, 40 cc of clear fluid with some tan mucus. The mucosal surface is tan with gastric rugae. There is no peptic ulcer disease or tumor noted grossly. The small bowel demonstrates a normal anatomic distribution. The lumen contains moderate amounts of thick, yellow-tan, semi-liquid fecal material. The mucosal surface is tan and wrinkled. The appendix

is present and unremarkable grossly. The large bowel demonstrates a normal anatomic distribution. The lumen contains well-formed, brown, firm fecal material. The mucosal surface is tan and wrinkled.

SPLEEN: The spleen is intact and weighs 100 grams. The external surface is purple and smooth. Serial sections reveal a firm, reddish-purple splenic parenchyma.

LIVER: The liver is intact and weighs 850 grams. The external surface is reddish-brown, smooth, and glistening. Serial sections reveal a firm, reddish-brown, lobular, congested liver tissue.

GALLBLADDER: The gallbladder is intact. The lumen contains 8 cc of liquid yellowish-brown bile. The mucosal surface is smooth and bile stained. The cystic duct and common bile duct are intact and patent throughout their course. The portal vein, splenic vein, and superior mesenteric vein are intact and patent throughout their course.

PANCREAS: The pancreas is of normal size, shape, and position, and has a tan, lobular, firm gross appearance.

ADRENALS: Both adrenals are identified. Serial sections reveal a thin yellow cortex and a brown medulla.

KIDNEYS: Both kidneys are identified. The capsules strip easily. The left kidney weighs 142 grams; the right kidney weighs 141 grams. The cortical surfaces are reddish-brown and smooth. Bivalving of each kidney reveals a well-demarcated, reddish-brown cortex and medulla. The renal papillae are normal. There is no calyceal scarring. There is no unusual pelvic dilatation. Both ureters are present, patent, and uniform in diameter throughout.

BLADDER: The bladder is intact. The lumen contains 200 cc of clear, pale-yellow urine. The bladder mucosa is tan and wrinkled.

GENITALIA: The upper vaginal vault is intact. The vaginal mucosa is tan and wrinkled. The cervix is small, tan, and smooth. The external os is circular and patent. The endocervical canal is patent. The uterus is of normal size, shape, and position. Bivalving the uterus reveals a symmetrical endometrial cavity lined by a lush, tan, secretory endometrium. Both ovaries are intact. The right ovary contains a corpus lutea, which has a central hemorrhagic appearance related to previous ovulation. Both fallopian tubes are intact and demonstrate normal gross features.

MUSCULOSKELETAL SYSTEM: Careful evaluation reveals no evidence of any injuries other than those to be described under the head.

LYMPHATICS: There are some reactive lower respiratory tract lymph nodes.

VENOUS SYSTEM: There is no evidence of hepatic vein, renal vein, or portal vein thrombosis. The superior and inferior vena cavae are intact and demonstrate normal gross

features.

CENTRAL NERVOUS SYSTEM: There are large lacerations, which are somewhat reflected involving the four corners of the scalp. There is long, thick, bloodstained black hair measuring 12" in length. The normal contour of the cranium is prominently distorted by extensive fracturing involving the anterosuperior sagittal suture; fractures on both sides of the right and left parietotemporal areas; and there are posterior fractures. These fractures are comminuted with the production of many fracture fragments, some with pulverized brain tissue. Present posteriorly and laterally on the left side of the cranium is a large cavitory defect through which a portion of the brain is evacuated. This measures 5" x 3" in size. Both cerebral hemispheres are outside of the cranial vault. The cerebral hemispheres are completely detached from one another with lacerations of the septum pellucidum and laceration-transection of the corpus callosum. The evacuated brain weighs 1100 grams and externally demonstrates multifocal subarachnoid hemorrhage, both laterally and medially. Serial sectioning the cerebral hemispheres reveals several small intraparenchymal hemorrhages. There is also some intraventricular hemorrhage. Examination of the base of the skull reveals extensive fracturing. There has been collapse of the foramen magnum; transection to the brainstem at the level of the upper spinal cord and medulla oblongata union. The tentorium is lacerated, and the brainstem has been evacuated and was never identified. There is a large circular defect in the midline of the base of the skull in the area of the posterior temporal fossae and sphenoid bone with loss of the pituitary gland. As previously described, C1 and C2 are fractured, and there has been laceration and fracturing of the odontoid ligament and odontoid process.

TOXICOLOGY:

Blood: I obtained one gray-stoppered test tube of blood from the heart. I obtained two purple-stoppered test tubes of blood from the heart. I obtained one red-stoppered test tube of blood from the heart.

Urine: I obtained two gray-stoppered test tubes of pale urine.

Vitreous Humor: I obtained one gray and one red-stoppered test tubes of vitreous humor.

Additionally, I obtained one vial of liver, one vial of gastric contents, and I obtained one gray-stoppered test tube of bile.

TRACE EVIDENCE:

I obtained one flattened lead pellet measuring 5/8" x 3/8". This had fallen out of the cranial vault when a head block had been placed underneath the head. Also falling out was a piece of silver-gray metal measuring 5/16" in length, also a piece of white, which appears to be plastic material. This is flattened, measuring 1-1/2" x 1" and had fallen through the base of the skull.

These are appropriately measured, described, and given to Lt. Steve Guggenheim, head of the Crime Lab in the Clear Creek County Sheriff's Office.

With respect to possible identification by DNA of the decedent, I obtained buccal swabs from the mouth, psoas muscle, and two purple test tubes of blood. One purple-stoppered test tube of blood is given to Lt. Guggenheim and a second purple-stoppered test tube of blood will be packaged with the toxicology specimens and stored for one year at the ChemaTox toxicology laboratory.

PAIS, Sol

Dr. Galloway

MICROSCOPICS:

Sections of major organs confirm the gross autopsy findings. Additionally, sections of liver reveal a mild portal triaditis. Sections of lung reveal mild atelectasis.

TOXICOLOGY:

Blood Alcohol	None detected
Urine Alcohol	None detected
Vitreous Alcohol	None detected
Blood Drug Screen	None detected