

ARMED FORCES INSTITUTE OF PATHOLOGY Office of the Armed Forces Medical Examiner

1413 Research Blvd., Bldg. 102 Rockville, MD 20850 1-301-319-0000



AUTOPSY EXAMINATION REPORT

Name: BTB Ali, Muhammad Najib Abu-Wafa

SSAN: (b)(6)

Age: Approximately 52 years old Date of Death: (b)(6) 2008

Date/Time of Autopsy: 05 SEP 2008/0930

Date of Report: 19 NOV 2008

Autopsy No.: (b)(6)

AFIP No.: (b)(6)

Rank: Civilian Detainee Place of Death: Iraq

Place of Autopsy: Port Mortuary

Dover AFB, Dover, DE

Circumstances of Death: This approximately 52-year-old civilian male detainee was housed at Camp Bucca, Iraq. Available investigative reports indicate that (b)(6) collapsed to the concrete floor of his tent as reported by fellow detainees. Emergency medical personnel responded and reported that (b)(6) related to them that he had fallen. Despite aggressive medical intervention (b)(6) succumbed to his injuries.

Authorization for Autopsy: Armed Forces Medical Examiner, per 10 U.S. Code 1471

Identification: Presumptive identification by accompanying reports, identification tags and documentation. A postmortem dental examination, postmortem fingerprint examination, and a postmortem DNA sample are taken for profile purposes should examplars become available for positive identification.

CAUSE OF DEATH: Blunt force trauma of the head

MANNER OF DEATH: Accident

EXTERNAL EXAMINATION

Injuries will be described in detail in a separate section, and will only be briefly alluded to in the remainder of the report, for purposes of orientation and completeness. The body is that of a well-developed, well-nourished appearing, adult male. The body is received unclothed. The decedent is wrapped in a multiple layers of cloth sheets and absorbent pads. The remains are 69-inches in length, and weigh 151-pounds. Lividity is present and fixed on the posterior surface of the body except in areas exposed to pressure. Rigor is present to an equal degree in all extremities. The temperature of the body is that of the refrigeration unit.

The head is normocephalic. The right occipital scalp is covered with curly black and white hair, the remainder of the scalp is shaved. Facial hair consists of a gray and white beard and mustache. The irides are brown. The corneae are hazy. The pupils are round and equal in diameter. The sclerae are muddy and without petechial hemorrhage. The external auditory canals, external nares, and oral cavity are free of foreign material and abnormal secretions. The ears are on remarkable. The nares are patent and the lips are atraumatic. The upper and lower frenula in the oral cavity are intact. The nasal skeleton and maxillae are palpably intact. The teeth appear natural and in fair condition. The neck is straight, and the trachea is midline and mobile.

The chest is symmetric. The abdomen is flat. The genitalia are those of a normal adult circumcised male. The testes are descended and free of masses. Pubic hair is present in a normal male distribution. The buttocks and anus are unremarkable.

The upper and lower extremities are symmetric and without clubbing or edema. There is amputation of the distal tips of the 1st and 2nd digits of the left hand. The fingernails are intact and the nail beds are cyanotic. There is hyperkeratosis of the heels of both feet.

Identifying marks include multiple scars:

- A 2 1/2 x 1/8-inch well healed hypopigmented scar on the right lower quadrant of the abdomen
- A well healed 4 x 1 1/2-inch scar is on the left upper chest with absence of the left nipple
- A 4 x 1/2-inch vertically oriented hypopigmented scar in the midline of the lower abdomen

CLOTHING AND PERSONAL EFFECTS

No clothing items or personal effects accompany the body at the time of autopsy.

MEDICAL INTERVENTION

- A gauze dressing, secured beneath the chin, covers the calvarium and the eyes
- On the left frontal, parietal, and temporal scalp is an 11 1/4-inch curvilinear stapled surgical incision
- A drain exiting from the left occipital scalp contains 25-milliliters of red tinged fluid
- A ventriculostomy tube exits the right parietal scalp
- Angiocatheter in the right subclavian space
- Urinary bladder catheter
- Rectal temperature probe
- Intravenous catheters in the right antecubital fossa, right volar wrist, volar left forearm, and dorsal right foot
- A clear plastic identification tag in circles the right wrist. (b)(6)
- Plastic identification tag in circles the left wrist, (b)(6)
- Multiple therapeutic needle puncture sites on the forehead, abdomen, left upper chest, and both ankles
- Gauze bandage on medial left ankle

RADIOGRAPHS

A complete set of postmortem radiographs is obtained and demonstrates the following:

- Medical interventions as listed above
- Healed fracture of the left ulnar styloid
- Bone flap removed from the left fronto-temporal calvarium
- Midline shift brain to the right
- Edema of the left hemisphere with effacement of the left lateral ventricle
- Dilated right lateral ventricle posteriorly, blood in poster warned
- Blood collection in both frontal lobes, anterior horns bilaterally
- Subdural hemorrhage involving the frontal lobes, right greater than left
- Linear skull fracture of the right occiput
- Bilateral pleural effusions and patchy consolidation of the lungs
- No internal metallic fragments

EVIDENCE OF INJURY

The ordering of the following injuries is for descriptive purposes only, and is not intended to imply order of infliction or relative severity.

There is an irregular linear fracture of the posterior aspect of the petrous portion of the right temporal bone extending anteriorly into the right middle cranial fossa and posteriorly into the right posterior cranial fossa and posterior right parietal bone. On the posterior right shoulder are multiple vertically oriented fine superficial linear abrasions measuring up to 2 1/2-inches length. Additional autopsy findings pertaining to the head are described in "Evidence Of Medical Intervention and/or Internal Examination-Head And Central Nervous System".

Evidence of Injury (Cont):

Incision and dissection of the posterior neck, subcutaneous tissues of the torso and extremities, demonstrates no deep paracervical muscular injury, no cervical spine fractures, or evidence of blunt force trauma.

INTERNAL EXAMINATION

BODY CAVITIES:

The body is opened by the usual thoraco-abdominal incision and the chest plate is removed. The ribs, sternum, and vertebral bodies are visibly and palpably intact. No adhesions are present in the pleural, pericardial, or peritoneal cavities. There are bilateral pleural effusions (right-275-milliliters, left-175-milliliters). There are 450-milliliters of straw colored fluid in the peritoneal cavity. All body organs are present in their normal anatomic positions. There is no internal evidence of blunt force or penetrating injury to the thoraco-abdominal region.

The subcutaneous fat layer of the abdominal is 3/4-inches thick.

HEAD AND CENTRAL NERVOUS SYSTEM:

(See above "Evidence of Injury")

The scalp is reflected. Subgaleal hemorrhage is associated with the underlying fractures and medical intervention. There is a non-quantifiable subdural hemorrhage in the right anterior cranial fossa. The therapeutic medical devices are documented and removed. The 1480-gram brain and dura are removed and placed in formalin for formal Neuropathology consultation.

Formal Neuropathology Consultation:

GROSS DESCRIPTION:

Brain weight: 1,401 grams

The specimen consists of the intracranial dura and brain of an adult.

A recent craniectomy has resulted in the absence of the posterior-lateral frontal, lateral parietal/superior-lateral temporal and anterior-lateral occipital portion of the left cerebral dura. The dorsal margin of the dural defect consists of a row of tapered dural tahs with attached black sutures. The right convexity dura and the falx cerebri are intact. The paramedian dural arachnoid granulations are red-black due to accumulated acute subarachnoid blood. Scattered strands of red-black, coagulated blood up to 0.3-centimeters thick and 2-centimeters in greatest diameter adhere loosely to the inner surface of the right and left paramedian dura, the left surface of the falx cerebri, or lie loosely on the arachnoid surface of each paramedian cerebral hemisphere. The venous sinuses are patent.

A moderately deep craniectomy groove indents the left cerebral surface, outlining an elevated (herniated) oval area approximately 9 (anterior-posterior) by 6 (dorsal-ventral) centimeters involving the lateral parietal, lateral anterior two-thirds occipital and

superior temporal lobes. A ventriculostomy tube has been inserted into left dorsal mid frontal lobe approximately 3 centimeters from the medial margin.

Red-brown cortical contusions characterized by cortical hemorrhages, cortical necrosis, leptomeningeal and cortical laceration and cortical and subcortical hematomas (up to 2.5 centimeters in greatest dimension) are situated in: anterior portion of the left inferior temporal gyrus, the anterior portion of the left superior temporal gyrus, the posterior portion of left superior temporal gyrus, the left lateral parietal lobe. Clusters of similar contusions are also present over the left inferior temporal pole (4 x 3 centimeter), the left inferior frontal pole (4 x 4 centimeter), the right inferior frontal pole (3 x 3.5 centimeter) and the right inferior temporal pole (2.5 x 2 centimeters).

There is a thin red-brown subarachnoid hemorrhage over the base of the pons and the left cerebellar peduncle. A thin, horizontal rim of similar subarachnoid hemorrhage (probably gravitational) is present over the posterior margins of the right and left cerebellar hemispheres.

Except as noted, the leptomeninges are thin, delicate and transparent. The cerebral gyri are soft, white and flattened due to swelling but have an anatomically normal configuration. The perisellar, perimesencephalic and basal cisterns are completely effaced due to brain swelling. Deep tentorial grooves indent each uncus, 0.8 centimeters on the left and 0.5 centimeters on the right. The left groove is continuous with a left parahippocampal groove. The brainstem is displaced rightward with subsequent flattening of the right surface of the midbrain. The cerebellar tonsils are deformed due to pressure against the foramen magnum.

The arteries at the base of the brain follow a normal distribution and there are no aneurysmal dilatations or sites of occlusion.

Coronal sections of the cerebrum reveal the above noted abnormalities.

In addition, there is a swollen left cerebral hemisphere with a sharply demarcated zone of softness, gray-white discoloration and blurring of the grey matter/white matter margins due to ischemic necrosis in the entire distribution of the left middle cerebral artery. There is a prominent rightward shift of the cerebral hemispheres with rightward bowing of the interhemispheric fissure and subfalcine herniation of the right cingulate gyrus. The ventriculostomy tube perforates the left frontal lobe in a ventral-medial direction and perforates the midline corpus callosum where there is interventricular hemorrhage and an approximately 3 centimeter in diameter left medial thalamic hematoma.

The ventricular system is disrupted at the above noted ventriculostomy perforation in the corpus callosum. The bodies of the lateral ventricles are not enlarged. The occipital horn of the right lateral ventricle is larger than the left (2.5 centimeter in diameter vs 0.5 centimeter) reflecting some degree of proximal obstruction. The Aqueduct of Sylvius is

Neuropathology Consultaion (Cont):

patent with a normal size and configuration. The choroid plexus is unremarkable and the ependymal surfaces are smooth and glistening.

MICROSCOPIC EXAMINATION:

Blocks of tissue for microscopic examination are removed from: (1) left lateral frontal lobe, (2) anterior corpus callosum, (3) left medial striate body, (4) left uncus, (5) left thalamus, (6) right hippocampus, (7) left occipital lobe, (8) right occipital lobe, (9) caudal midbrain, (10) medulla, (11) left cerebellum and (12) dura.

Sections from blocks 1-12 are stained with H & E. Sections 1-11 are also stained with Bielschowsky and LFB techniques and immunostained for β-APP, GFAP and β-amyloid.

COMMENT:

There is widespread grey and white matter edema and scattered acute ischemic neuronal injury (" red neurons ") in sections of the left cerebrum (blocks 1, 2, 4 & 7) consistent with acute infarction which is probably related to the left trans craniectomy herniation. The acute hemorrhage of the left striate body and the adjacent corpus callosum and pooled blood in the occipital horn of the right lateral ventricle are related to the penetration of the ventriculostomy tube. The array of cortical contusions along the margin of the craniectomy defect is due to the pressure of the brain against the bone margin resulting from the underlying brain swelling. The left uncal necrosis resulted from the left cerebral swelling -> left to right midline shift -> left cingulate gyrus herniation -> left transtentorial uncal.

The remaining lesions appear to be primarily due to trauma. Based on the described fractures, the impact occurred on the right side of the head (temporal/parietal) which would initiate lateral rotation acceleration whether due to a blow or a fall. The bilateral, paramedian subdural hematoma is consistent with this. The bilateral frontal and temporal cortical contusions and subcortical hemorrhages and the cerebral swelling are more severe on the left than the right making injury more suggestive of a fall then a blow.

It would be helpful if we could say pre-therapeutic images of this patient to more clearly separate the primary effects of the trauma from the secondary and therapeutic effects.

NECK:

The anterior strap muscles of the neck are homogeneous and red-brown, without hemorrhage. The thyroid cartilage and hyoid bone are intact. The larynx is lined by intact white mucosa. The tongue is free of bite marks, hemorrhage, or other injuries.

Incision and dissection of the posterior neck demonstrates no deep paracervical muscular injury or cervical spine fractures.

RESPIRATORY SYSTEM:

The upper airway is clear of debris and foreign material; the mucosal surfaces are smooth, yellow-tan and unremarkable. The pleural surfaces of the right lung are smooth, glistening and unremarkable. There are scattered loose pleural adhesions surrounding the left lung. The pulmonary parenchyma is salmon pink with anthracotic changes, congested and edematous, exuding copious amounts of blood and frothy fluid. No mass lesions or areas of consolidation are present. The right and left lungs weigh 780 and 760-grams, respectively.

CARDIOVASCULAR SYSTEM:

The pericardial surfaces are smooth, glistening and unremarkable. The 320-gram heart is contained in an intact pericardial sac free of significant fluid or adhesions. The epicardial surface is smooth, with minimal fat investment. The coronary arteries arise normally, follow the usual distribution in a right dominant pattern, are widely patent, and without evidence of thrombosis or significant atherosclerosis. The myocardium is homogeneous, red-brown, firm and unremarkable; the atrial and ventricular septae are intact. The walls of the left and right ventricles are 1.0 and 0.2-centimeters thick, respectively. The valve leaflets are thin and mobile. The aorta and its major branches arise normally, follow the usual course and are free of significant abnormalities. There is mild focal atherosclerotic streaking of the abdominal aorta. The venae cavae and their major tributaries return to the heart in the usual distribution and are free of thrombi. The renal and mesenteric vessels are unremarkable.

HEPATOBILIARY SYSTEM:

The hepatic capsule is smooth, glistening and intact, covering dark red-brown, moderately congested parenchyma. No mass lesions or other abnormalities are noted. The gallbladder contains 3-milliliters of green-brown mucoid bile; the mucosa is velvety and unremarkable. The extrahepatic biliary tree is patent and without evidence of calculi. The liver weighs 1460-grams.

GASTROINTESTINAL TRACT:

The esophagus is intact and lined by smooth, gray-white mucosa. The gastric wall is intact and the stomach contains approximately 20-milliliters of thin brown-gray fluid. The gastric mucosa is arranged in the usual rugal folds. The duodenum, loops of small bowel and colon are unremarkable. The appendix is not identified. Synthetic mesh is identified in the right inguinal canal.

GENITOURINARY SYSTEM:

The right and left kidneys weigh 160 and 140-grams, respectively. The renal capsules are smooth and thin, semi-transparent and strip with ease from the underlying smooth, red-brown cortical surface. The cut surfaces are red-tan and congested, with uniformly thick cortices and sharp corticomedullary junctions. The pelves and calyces are unremarkable.

Genitourinary System (cont):

The ureters are normal in course and caliber. White bladder mucosa overlies an intact bladder wall. The bladder contains approximately 100-milliliters of cloudy yellow urine. The prostate is normal in size, with lobular, yellow-tan parenchyma. The seminal vesicles are unremarkable. The testes are free of mass lesions, contusions, or other abnormalities.

LYMPHORETICULAR SYSTEM:

The 280-gram spleen has a smooth, intact capsule covering maroon, moderately firm parenchyma; the lymphoid follicles are unremarkable. Lymph nodes in the hilar, periaortic, and iliac regions are not enlarged.

ENDOCRINE SYSTEM:

The pituitary gland is examined in-situ and is unremarkable. The thyroid gland is symmetric and red-brown, without cystic or nodular change. The pancreas is firm and yellow-tan, with the usual lobular architecture. No mass lesions or other abnormalities are noted. The right and left adrenal glands are symmetric, with bright yellow cortices and grey medullae. No masses or areas of hemorrhage identified.

MUSCULOSKELETAL SYSTEM:

Muscle development appears normal. No non-traumatic bone or joint abnormalities are noted.

ADDITIONAL PROCEDURES

- Documentary photographs are taken by OAFME staff photographers.
- Specimens retained for toxicology testing and/or DNA identification are: Blood, vitreous fluid, urine, gastric contents, bile, heart, spleen, liver, lung, kidney, adipose tissue, and skeletal muscle.
- 3. Full body radiographs are obtained and demonstrate the above findings.
- 4. Selected portions of organs are retained in formalin.
- 5. The dissected organs are forwarded with the body.
- 6. Personal effects are released to the mortuary affairs representatives.
- 7. Identifying body marks that include multiple scars have been documented.

MICROSCOPIC EXAMINATION

The brain is removed and placed in formalin for formal Neuropathology consultation. Selected portions of organs are retained in formalin, without preparation of histologic slides by OAFME.

FINAL AUTOPSY DIAGNOSES:

I. Evidence of trauma

- A. Linear fractures of the calvarium involving the right temporal, parietal, and occipital bones
- B. Superficial abrasions on the posterior right shoulder
- C. Subgaleal and subdural hemorrhage
- Evidence of closed head trauma and subsequent medical intervention (per formal Neuropathology consultation)
 - A. Diffuse grey and white matter edema with ischemic neuronal injury
 - B. Left transcraniectomy herniation
 - C. Left to right midline shift with left cingulate gyrus and the left transtentorial uncal herniations
 - D. Cortical contusions of the frontal and temporal lobes, bilaterally
 - E. Subarachnoid and intraventricular hemorrhage

III. Natural disease diagnoses

- A. Evidence of prior appendectomy
- B. Evidence of prior right inguinal hernia repair
- C. Mild atherosclerotic streaking of the abdominal aorta
- D. Healed fracture of the left ulnar styloid
- E. Partial amputation of the distal 1st and 2nd digits of the left hand
- F. Absence of the left nipple, traumatic, healed

IV. Postmortem changes

- A. Lividity is fixed on the posterior surface the body except in areas exposed pressure
- B. Rigor is present to an equal degree in all extremities

VI. Toxicology results

- A. Volatiles: The blood and vitreous fluid were examined for the presence of ethanol at a cutoff of 20 mg/dL. No ethanol was detected.
- B. Drugs: The urine was screened for acetaminophen, amphetamine, antidepressants, antihistamines, barbiturates, benzodiazepines, cannabinoids, chloroquine, cocaine, dextromethorphan, lidocaine, narcotic analgesics, opiates, phencyclidine, phenothiazines, salicylates, sympathomimetic amines, and verapamil by gas chromatography, color test or immunoassay. The following drugs were detected:
 - Positive Opiate: Morphine was detected in urine by gas chromatography/mass spectrometry. The blood contained in 0.18 mg/L of morphine as quantitated by gas chromatography/mass spectrometry.
 - Positive Lidocaine: Lidocaine was detected in urine by gas chromatography and confirmed by gas chromatography/mass spectrometry.

VI. Toxicology results (cont):

- C. Carbon Monoxide: The carboxyhemoglobin saturation in the blood was less than 1% as determined by spectrophotometry with the limit of quantitation of 1%. Carboxyhemoglobin saturations of 0-3% are expected for non-smokers. Saturations above 10% are considered elevated are confirmed by gas chromatography.
- D. Cyanide: There was no cyanide detected in the blood. The limit of quantitation for cyanide is 0.25 mg/dL. Normal blood cyanide concentrations are less than 0.15 mg/L. Lethal concentrations of cyanide are greater than 3 mg/L.

OPINION

This approximately 52-year-old male detained at Camp Bucca Iraq, BTB (b)(6) (b)(6)died as the result of blunt force trauma of the head. Autopsy findings show evidence of skull fractures and subsequent medical intervention. No gross or x-ray evidence of recent penetrating or additional significant blunt force trauma is identified. A formal Neuropathology consultation is obtained and demonstrates the findings described above. Post mortem analysis of the body fluids for ethanol, carbon monoxide, cyanide, and screened illicit drugs of abuse are negative. The presence of morphine in the blood and lidocaine in the urine are consistent with the reported history of medical intervention and do not contribute to the cause or manner of death. (b)(6) injuries are consistent with a blow to the head or a fall. The review of available investigative reports, medical records, and Neuropathology consultation taken in conjunction with the absence of defensive injuries suggests that an accidental fall is more likely the cause of (b)(6) injuries. A blow to the head cannot be ruled out as the cause of the closed head trauma. However, with reasonable medical certainty the manner of death is best classified as accident. Should additional information become available that would change the cause or manner of death, an amended report will be issued.

(b)(6)	
(b)(6)	Medical Examiner

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