



ARMED FORCES INSTITUTE OF PATHOLOGY
Office of the Armed Forces Medical Examiner
 1413 Research Blvd., Bldg. 102
 Rockville, MD 20850
 301-319-0000



AUTOPSY EXAMINATION REPORT

Name: **BTB Ibrahim, Ahmad Awwad**
 ISN: (b)(6)
 Date of Birth: **BTB (b)(6) 1987**
 Date of Death: (b)(6) 2009
 Date/Time of Autopsy: 22 Jan 2009 @ 1000
 Date of Report: 07 APR 2009

Autopsy No.: (b)(6)
 AFIP No.: (b)(6)
 Rank: Civilian Detainee
 Place of Death: Iraq
 Place of Autopsy: Port Mortuary,
 Dover AFB, DE

Circumstances of Death: This 21-year-old Iraqi Civilian was a detainee at Camp Bucca, Iraq when he reportedly awoke with shortness of breath and clutching his chest. He lost consciousness and was transported to the guard by other detainees. Medical personnel were dispatched and brought him to the medical facility where all resuscitative efforts were unsuccessful.

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

Identification: Presumptive identification is established by mortuary identification tags. Fingerprints and a DNA sample are taken for comparison to an exemplar if one becomes available.

CAUSE OF DEATH: Lymphocytic Myocarditis

MANNER OF DEATH: Natural

EXTERNAL EXAMINATION

The body is that of a well-developed, well-nourished unclad male. The body weighs 177 pounds, is 73 inches in length and appears compatible with the reported age of 21 years. The body is cold. Rigor is absent in all extremities. Lividity is present and fixed on the posterior surface of the body, except in areas exposed to pressure. There is slight marbling of the torso and both lower extremities.

The head is normocephalic, and the scalp hair is short black. Facial hair consists of black beard and moustache stubble. The irides are brown. The corneae are cloudy. The conjunctivae are congested. The sclerae are white. The external auditory canals, external nares and oral cavity are free of foreign material and abnormal secretions. The nasal skeleton and maxilla are palpably intact. There is a 3/8 x 1/8 inch dried abrasion on the left side of the forehead. On the left temple is a 3/4 x 1/2 inch abrasion. On the bridge of the nose is a 1/4 x 1/16 inch abrasion. The lips are without evident injury. The teeth are natural and in good condition. Examination of the neck reveals no evidence of injury; the trachea is palpably in the midline of the neck.

The chest is symmetric with normally formed male breasts that are free of masses. There is a 4 x 3-inch patterned burn / abrasion on the right side of the chest. On the lateral left side of the chest is a 3-1/2 x 3-1/2 patterned burn / abrasion. The abdomen is flat without recent trauma. Healed surgical scars are not noted on the torso. The external genitalia are those of a circumcised adult male, and the pubic hair is in an appropriate distribution. There is mild folliculitis on the posterior torso and the anus is without note.

The extremities are symmetric and normally formed without evidence of significant recent trauma. There is a 2 x 1 inch contusion on the dorsal surface of the left hand. There are three abrasions each measuring 1/8 x 1/8-inch on the dorsal surface of the left hand. The fingernails are trimmed and intact. The toenails are unremarkable. A tattoo (b)(6)

(b)(6)

CLOTHING AND PERSONAL EFFECTS

- Personal effects (contained in a green personal effects bag attached to the left wrist) are removed by Port Mortuary personnel prior to autopsy
- Accompanying the body are yellow boxer shorts (cut), yellow pants (cut), and yellow sweat pants (cut)

MEDICAL INTERVENTION

- EKG patch on the left lower quadrant of the abdomen
- Multiple needle sticks on the chest, bilateral antecubital areas, and right inguinal area
- Interosseous catheter is noted in the anterior right leg
- Burn abrasions on the chest from the defibrillator pads

RADIOGRAPHS

A complete set of postmortem radiographs and CT images are obtained and demonstrates the following:

- Multiple bilateral anterior rib fractures (CPR related)
- No skull, vertebral, or long bone fractures
- No metallic foreign bodies are noted

EVIDENCE OF INJURY

There is no evidence of recent significant injury.

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. There are bilateral pleural adhesions with areas of loculated clear fluid in the pleural space. There are adhesions between the diaphragm and the right lobe of the liver. There are no abnormal collections of fluid in the pericardial or peritoneal cavities. All body organs are present in normal anatomical position.

HEAD AND CENTRAL NERVOUS SYSTEM:

The scalp is reflected. The galeal and subgaleal soft tissues of the scalp are free of injury. There are no skull fractures. The calvarium of the skull is removed. The dura mater and falx cerebri are intact. There is no epidural, subdural or subarachnoid hemorrhage present. The leptomeninges are thin and delicate. The cerebral hemispheres are symmetrical. The blood vessels at the base of the brain are intact and symmetrical without significant atherosclerosis. The cranial nerves are likewise symmetrical and intact.

The brain weighs 1,436-grams and is fixed prior to further examination and submission for expert consultation. See Addendum A for complete details.

NECK:

The anterior strap muscles of the neck are homogenous 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.

CARDIOVASCULAR SYSTEM:

The 460-gram heart is contained in an intact pericardial sac. The epicardial surface is smooth, with minimal fat investment. The coronary arteries arise normally and are present in a normal distribution, with a right-dominant pattern. Cross sections of the major coronary arteries demonstrate no luminal narrowing. The heart is fixed prior to further examination and submission for expert consultation. See Addendum B for complete details.

The aorta is without atherosclerosis and gives rise to three intact and patent arch vessels. The renal and mesenteric vessels are unremarkable.

RESPIRATORY SYSTEM:

The upper airway is clear of debris and foreign material; the mucosal surfaces are smooth, yellow-tan and unremarkable. The parietal pleural surfaces have extensive adhesions bilaterally.

The right lung weighs 1,720-grams; the left 1,040-grams. The pulmonary parenchyma is diffusely congested and edematous, exuding copious amounts of blood and frothy fluid; no focal lesions are noted. The visceral pleural surfaces have extensive adhesions bilaterally.

The pulmonary arteries are normally developed, patent and without thrombus or embolus.

HEPATOBIILIARY SYSTEM:

The 1,760-gram liver has an intact smooth capsule covering moderately congested tan-brown parenchyma with no focal lesions noted. There are adhesions over the right lobe of the liver extending to the diaphragm.

The gallbladder contains 1-milliliter of green-brown, mucoid bile; the mucosa is velvety and unremarkable. The extrahepatic biliary tree is patent, without evidence of calculi.

GASTROINTESTINAL SYSTEM:

The esophagus is lined by gray-white, smooth mucosa. The gastric mucosa is arranged in the usual rugal folds and the lumen contains 400-milliliters of brown granular fluid.

The small and large bowels are unremarkable. The pancreas has a normal pink-tan lobulated appearance. The appendix is present.

GENITOURINARY SYSTEM:

The right kidney weighs 160-grams; the left 140-grams. The renal capsules are smooth and thin, semi-transparent and strip with ease from the underlying smooth, red-brown cortical surfaces.

The cortices are sharply delineated from the medullary pyramids, which are red-purple to tan and unremarkable. The calyces, pelves and ureters are unremarkable.

White bladder mucosa overlies an intact bladder wall. The bladder contains approximately 5-milliliters of cloudy yellow urine. The testes, prostate gland and seminal vesicles are without note.

LYMPHORETICULAR SYSTEM:

The thymus is small, fatty and otherwise unremarkable. The 280-gram spleen has a smooth, intact capsule covering red-purple, 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 grossly unremarkable. The thyroid gland is symmetric and red-brown, without cystic or nodular change. The parathyroid glands are not identified. The right and left adrenal glands are symmetric, with bright yellow cortices and red-brown medullae; no masses or areas of hemorrhage are identified.

MUSCULOSKELETAL SYSTEM:

Superficial posterior skin incisions are negative for traumatic injuries. Superficial incisions of each ankle and wrist region show no evidence of trauma or binding. No non-traumatic abnormalities of muscle or bone are identified.

SLIDE KEY AND MICROSCOPIC EXAMINATION

1. Kidney – Unremarkable glomeruli with post mortem autolysis of the tubules.
Liver – Normal hepatic architecture with congestion and mild chronic peri-portal inflammation.
Spleen – Congestion with autolysis and no focal lesions.
2. Lung (all five lobes) – Pulmonary congestion with extravasated red blood cells in the alveolar spaces and pulmonary edema.

TOXICOLOGY

The blood and vitreous fluid are examined for the presence of volatile compounds including ethanol at a cutoff of 20-milligrams per deciliter. No ethanol is detected.

The blood is screened for medications and drugs of abuse including acetaminophen, amphetamine, antidepressants, antihistamines, barbiturates, benzodiazepines, cannabinoids, chloroquine, mefloquine, 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 Lidocaine: Lidocaine was detected in the blood by gas chromatography and confirmed by gas chromatography/mass spectrometry.

The carboxyhemoglobin saturation in the blood was less than 1% as determined by spectrophotometry with a limit of quantitation of 1%.

There was no cyanide detected in the blood. The limit of quantitation for cyanide is 0.25-milligrams per liter.

ADDITIONAL PROCEDURES

1. Documentary photographs are taken by (b)(6) OAFME staff photographer.
2. Personal effects are released to the appropriate mortuary operations representatives.
3. Specimens retained for toxicology testing and/or DNA identification are: vitreous fluid, blood, bile, gastric contents, heart, spleen, liver, lung, kidney, myocardium, adipose tissue and skeletal muscle.

4. The dissected organs are forwarded with body except for the heart and brain.
5. The heart is sent for Cardiovascular Pathology consultation.
6. The brain is sent for Neuropathology consultation.

FINAL AUTOPSY DIAGNOSES

- I. **Cardiovascular System (see Addendum B)**
 - A. Lymphocytic Myocarditis
 - B. Right ventricular dilatation, mild
- II. **Natural diseases or pre-existing conditions identified:**
 - A. Pulmonary congestion, edema, and adhesions
 - B. Hepatosplenomegaly
 - C. Cerebral edema
- III. **Evidence of Medical Therapy:**
 - A. EKG patch on left lower quadrant of the abdomen
 - B. Multiple therapeutic needle sticks
 - C. Interosseous catheter in the right anterior leg
 - D. Burn abrasions on the chest from the defibrillator pads
- IV. **Post-Mortem Changes:**
 - A. Rigor is absent in all extremities
 - B. Lividity is posterior and fixed except in areas exposed to pressure
 - C. There is marbling of the torso and both lower extremities
 - D. The body temperature is cold to touch
- V. **Identifying Body Marks:**
 - A. Tattoo (b)(6)
- VI. **There is no evidence of trauma or physical abuse.**
- VII. **Toxicology:**
 - A. No ethanol was detected in the blood and vitreous fluid
 - B. Lidocaine is detected in the blood
 - C. No carbon monoxide was detected in the blood
 - D. No cyanide was detected in the blood

OPINION

This 21-year-old, BTB (b)(6) died of lymphocytic myocarditis. Per investigation (b)(6) was found by other detainees complaining of shortness of breath and clutching his chest. While the other detainees were bringing him to the guard he lost consciousness. Medical personnel were dispatched and took (b)(6) to the medical facility where resuscitative efforts were unsuccessful. At autopsy, he had extensive adhesions around both his lungs as well as on the right upper lobe of the liver. His heart showed mild right ventricular dilatation with histological evidence of lymphocytic myocarditis. There is no evidence of trauma or foul play. A review of the limited medical records available was non-contributory. The toxicological screen for ethanol, carbon monoxide, cyanide, and illicit drugs of abuse are negative. The toxicological screen for medications was positive for lidocaine which if more than likely from resuscitative efforts.

Myocarditis is defined as inflammatory changes in the heart muscle and is characterized by myocyte (individual heart muscle cells) necrosis (death). The causes of myocarditis are numerous and can be roughly divided into infectious, toxic, and immunologic etiologies, with viral etiologies most common. Coxsackievirus B is the most common viral cause of myocarditis but other viruses implicated in causing myocarditis include influenza virus, echovirus, herpes simplex virus, hepatitis, Epstein-Barr virus, and cytomegalovirus. Nonviral infectious causes include diphtheria, Chagas disease, Streptococcal species, Staphylococcal species, Bartonella, Brucella, Leptospira, and Salmonella species. Toxic myocarditis can be caused by medications such as penicillin, doxorubicin, zidovudine (AZT) or environmental toxins such as lead, arsenic, and insect stings (scorpion or spiders). Immunologic etiologies of myocarditis encompass a number of clinical syndromes and include systemic lupus erthematosus, rheumatoid arthritis, scleroderma, Kawasaki disease, sarcoidosis, and giant cell arteritis.¹²³⁴ The decedent has no history of toxic exposure and there is no evidence of bacterial or systemic disease. The histological finding in this case of a lymphocytic infiltrate within the heart muscle is suggestive of a viral cause of his myocarditis.

The manner of death is Natural.

(b)(6)

(b)(6) Medical Examiner

(b)(6)

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

¹Baboonian C, Davies MJ, Booth JC, McKenna W: Coxsackie B viruses and human heart disease. *Curr Top Microbiol Immunol* 1997; 223:31-52.
²Feldman AM, McNamara D: Myocarditis. *N Engl J Med* 2000; 343:1388-1398.
³Weinstein C, Fenoglio JJ: Myocarditis. *Hum Pathol* 1987; 18:613-618.
⁴Maron BJ: Medical progress: Sudden death in young athletes. *N Engl J Med* 2003; 349:1064-1075.

ADDENDUM A: Neuropathology Consultation Report

ARMED FORCES INSTITUTE OF PATHOLOGY
NEUROPATHOLOGY REPORT

CASE NUMBER: (b)(6)

PATIENT NAME (b)(6)

DATE OF EXAMINATION: 02/19/09

GROSS DESCRIPTION:

Brain weight: 1436 gm

The specimen consists of the brain of an adult.

The brain is diffusely swollen with widened gyri, narrowed sulci, effaced basilar cisterns, swollen cerebellar tonsils and an effaced cerebellomedullary cistern. Moderately deep tentorial grooves indent each uncus approximately 0.6 cm from the medial margins. There is no associated visible uncus cortical or cerebellar tonsil cortical injury.

The leptomeninges are thin, delicate and transparent. Except as noted, the cerebral gyri have normal configuration and consistency.

There is no sign of midline shift. Except as noted, the external aspects of the brainstem and cerebellum are not remarkable. The arteries at the base of the brain follow a normal distribution and are free of atherosclerosis. There are no aneurysmal dilatations or sites of occlusion. The identifiable cranial nerve roots are not remarkable.

Coronal sections of the cerebrum reveal dissolution of the septum pellucidum due to edema and early autolysis. The demarcation between cerebral gray and white matter is blurred due to swelling and edema. There are no focal lesions in the cortex, white matter or deep nuclear structures. There is no midline shift. Sections of the midbrain, pons, medulla and cerebellum show no focal abnormalities. The substantia nigra and locus coeruleus are well pigmented.

The ventricular system and aqueduct of Sylvius are patent. The third ventricle is compressed due to brain swelling. The ventricular system is otherwise unremarkable with an anatomically normal configuration. The choroid plexus is unremarkable and the ependymal surfaces are smooth and glistening.

PHOTOGRAPHS: Yes

MICROSCOPIC EXAMINATION:

Blocks of tissue for microscopic examination are removed from: (1) right frontal lobe, (2) anterior corpus callosum/cingulate gyri/septum pellucidum, (3) right mid frontal lobe, (4) left uncus, (5) left insula/clastrum/putamen/globus pallidus/anterior limb of internal capsule, (6) left thalamus/substantia nigra/red nucleus/posterior limb of internal capsule, (7) right hippocampus/lateral geniculate nucleus/temporal horn of lateral ventricle/choroid plexus, (8) mid corpus callosum/cingulate gyri/caudate nucleus/internal capsule, (9) right calcarine cortex/occipital horn of lateral ventricle, (10) cerebellum, (11) midbrain, (12) pons and (13) medulla.

Sections from each block are stained with H&E and LFB/Bodian techniques and immunostained for β -amyloid precursor protein (β -APP).

COMMENT:

Microscopic sections show diffuse edema and widespread eosinophilic neurons (acute ischemic neuronal injury) in the frontal, cingulate gyral, hippocampal (subiculum), occipital, and basal ganglia gray matter.

There is no evidence of inflammation or trauma.

(b)(6)

NEUROPATHOLOGIST

ADDENDUM B: Cardiovascular Pathology Consultation Report



DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

AFIP Interdepartmental Consultation Report

AFIP ACCESSION NO. SEQUENCE NO.

(b)(6)	
(b)(6)	SSN:
(b)(6)	(b)(6)

February 17, 2009

(b)(6)

AFIP (b)(6)
1413 Research Blvd.
Bldg. 102
Rockville, MD 20850

DIAGNOSIS: (b)(6) **Heart, autopsy:**
-Lymphocytic myocarditis
-Mild right ventricular dilatation

History: 21 year old Iraqi male; height 185 cm, weight 80 kg; awoke with shortness of breath, collapsed, and could not be resuscitated; autopsy showed pleural adhesions

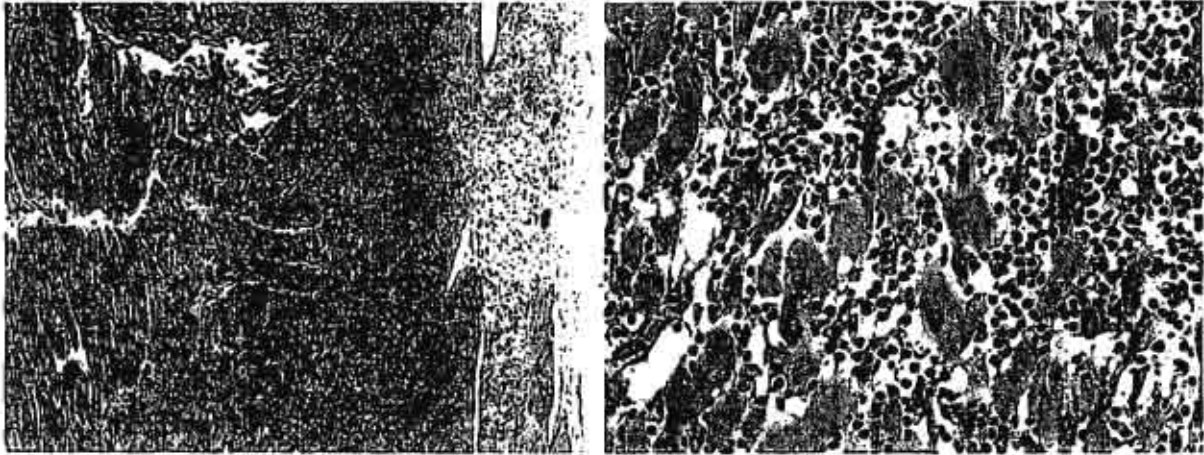
Heart: 460 g (per contributor) (predicted normal value 341 g, upper limit 481 g for 184 cm male); closed foramen ovale; mild right ventricular dilatation: left ventricular cavity diameter 27 mm, left ventricular free wall thickness 13 mm, anterior ventricular septum thickness 12 mm, posterior ventricular septum thickness 17 mm, right ventricular cavity diameter from acute angle to septum 43 mm, posterior right ventricle thickness 4 mm; valves grossly unremarkable; aortic root diameter 17 mm, pulmonary trunk diameter 15 mm; focal anterior and lateral left ventricular white discoloration; histologic sections demonstrate lymphocytic infiltrates primarily involving the subepicardial region of the left ventricle with patchy infiltrates in the subendocardial and mid myocardial regions and in the right ventricle with associated myocyte necrosis and healing areas with granulation tissue and fibrosis

Coronary arteries: Normal ostia; right dominance; no gross atherosclerosis

AFIP ACCESSION NO. SEQUENCE NO.
(b)(6)

(b)(6) SSN:
(b)(6)

February 17, 2009



Lymphocytic myocarditis in the left ventricle (left) with myocyte necrosis (right)

A copy of this report has been faxed to you at (b)(6)

(b)(6)

Department of Cardiovascular Pathology