

Admitted to 12th. General Hospital, 15 Sept. 1943, from 7th. Sta. Hosp.  
from Boat

Died, 20 Sept. 1943, of Hemolytic transfusion reaction due to transfusion of incompatible blood.

This 26 year old soldier was struck on the left shoulder, left thigh and left side of the head, by shell fragments. He was unconscious for an hour, was evacuated by boat to the 7th. Sta. Hosp., Oran, whence to the 12 th. Gen. Hosp. On arrival, he was confused, irritable, demanding, unpleasant, but after two days care improved and was able to give a history. There had been a few days of aphasia, now passed. There was a large deep gutter wound in the left temporo-parietal region, with exposed, fractured bone; the right pupil was slightly larger than the left but both reacted to light and accommodation. There was bilateral 3D swollen disc. There was peripheral 7th nerve weakness. Otherwise without neurological findings. The xray revealed a 2½ cm. defect in the left temporal squama, with metallic foreign bodies intra- and extracranially. The patient was operated upon 18 Sept., the exposed necrotic tissues of the wound excised, depressed bone removed, and the opening enlarged. Through an enlarged dural rent, pulped brain, bone chips and debris were irrigated out. There was troublesome bleeding from the posterior branch of the middle meningeal; and one chip was placed on a cortical vessel. Postoperatively the man was restless and complained of headache. In the afternoon he was given a 500cc. whole blood transfusion, immediately following which he had a severe chill and a massive hemorrhage appeared on the dressings, he turned white, respirations were labored, pulse slow and thready, Bp 170/70. He was taken at once to the operating room, and attempt made to control a diffuse hemorrhage from the operative site, Hot packs, pressure, Bovie coagulation, cotton, all were of no avail, over a 2 hour period, when, with rapidly falling blood pressure the patient died.

The salient features of the autopsy findings follow:

" The kidneys average 150 grams each and reveal no disturbance of their architecture. The parenchyma of both is unusually dark, particularly in the region of the pyramids, and bloody fluid pours from their cut surfaces. The pelves contain glossy bloody urine. Both ureters are filled with bloody urine, and the bladder contains an estimated 400 cc of similar fluid.

The calvarium upon removal discloses a rongeured defect the size of a half dollar in the left temporo-parietal region. The dura underlying the opening is purplish and tense. Removal of the brain and more detailed examination reveals an extensive loss of brain substance in the region of the left temporal lobe which amounts to the entire tip and represents a quantity of brain approximating two ounces. The cavity is filled with partially clotted blood. A silver clip is noted on one of the cortical vessels. Immediate section of the brain reveals no changes. The ventricle has not been exposed by the defect, which extends for a distance of three centimeters into the brain substance. There are no other findings in the head.

Spleen (1 sec): There is marked reticular hyperplasia, the follicles being obscured. The sinusoids are choked with cells and a yellow pigment, presumably hemoglobin.

Liver ( 2 blks; 2 sec): There is an excess of bile pigment in the canaliculi and sinusoids generally are dilated, their Kupffer cells being unusually distinct. There is a suggestive increase in periportal tissue with an unusual amount of round cell infiltration therein. The feature of chief interest is the infrequent occurrence of minute areas of focal necrosis, featured by the disappearance of one or two liver cells and replacement by clusters of lymphocytes and polynuclears.

Kidney (4 blks; 4 sec): The feature of note is the presence of homogeneous



orange casts in moderate numbers in the collecting tubules for the most part, although occasionally they are noted in the distal limb of Henle's loop. There appears to be no significant change in tubular epithelium. The glomeruli appear unchanged.

The terminal clinical history and postmortem findings in this patient conclusively show that the direct cause of death was a hemolytic transfusion reaction. Microscopic examination of the bloody urine found at autopsy revealed a particular absence of cells, and the specimen was grossly typical of that obtained in massive hemoglobinuria. The acid hematin casts in the collecting tubules are conclusive. Had this patient survived longer, he undoubtedly would have had a complete anuria, with the prospect of eventual death from anuria.

The recipient in this instance was a known type "O". The patient used as donor was supposedly a type "o" also, but upon retyping after the autopsy he was found to be a weak type "A", slight agglutination occurring at 20 minutes with the rabbit antisera. The donor's cells and recipient's serum were set up again. At five minutes there was no change, At seven minutes some of the cells suddenly disappeared without premonitory agglutination. Those remaining looked satisfactory. This process repeated itself again until at 15 minutes only a few cells were left under the microscope.

#### Clinical Diagnoses:

- (1) Fracture compound, comminuted, with laceration severe of cerebrum, left posterior-parietal, due to enemy bomb at Salerno, Italy, 9 Sept. 1943.
- (2) Wound, penetrating, minor, left thigh and left arm, incurred as in (1).
- (3) Brain operation, removal of FB's and bone, with control of hemorrhage.

#### Pathologic Diagnoses;

RESPIRATORY SYSTEM: Pulmonary edema, moderate; pulmonary atelectasis, partial; dust pigmentation of alveoli, marked.

SPLEEN & HEMATOPOIETIC TISSUES: Acute hyperplasia of splenic reticulo-endothelium.

LIVER: Focal necrosis; reticulo-endothelial hyperplasia; bile-staining, moderate.

GENITOURINARY SYSTEM: Transfusion kidneys, with acid hematin casts in collecting tubules.

CENTRAL NERVOUS SYSTEM: Traumatic loss of anterior portion of left temporal lobe; recent hemorrhage from left temporal lobe.

BONES & JOINTS: Combined traumatic and surgical loss of part of the squama of the left temporal bone.

MISCELLANEOUS: Lacerations, healing, of left shoulder and thigh; recent operative incision, sutured, in scalp over left temporal region; cyanosis, marked, of face and neck.