JAUNDICE IN SEVERE CASES OF SURGICAL TRAUMA, 12TH GENERAL HOSPITAL
(from 24 Jan 43 - 1 Jun 45)

Up to approximately 1 June 1945 the 12th General Hospital had discharged 10,161 patients who had sustained some sort of surgical trauma. Of these, 6,730 were battle casualties and 3,431 were injuries. In these cases there were sixteen reported diagnoses of hepatitis, of which twelve had jaundice. There were five deaths. Two of these deaths occurred in patients who had had accidental injuries with jaundice (Elliot and Richardson). In one of these (Elliot) it was felt that death was not directly attributable to the original trauma. There were three deaths in the battle casualty group, all in patients with jaundice. The four patients who had hepatitis without jaundice were battle casualties and recovered.

Since certain more severe types of wounds (arbitrarily, chest wounds, abdominal wounds, compound fractures, burns, and traumatic amputations were considered as "severe" wounds) were considered likely to require administration of blood, all casualties and injuries were categorized under these headings. If a wound of these types was not present, the case was listed simply as " Battle Casualty" of "Injury".

The incidence of the various types of wounds and injuries, singly and in combination follows:

Battle Casualty

	Totals	Hepatitis
Simple battle causalties	4019	
Compound fractures in battle casualties	2003	5
Traumatic amputations, " "	110	
Burns, battle casualties	122	2
Chest wounds	128	
Abdominal wounds	105	
Compound fracture and traumatic amputation	50	
Compound fracture and burns	12	
Compound fracture and chest wounds	94	1
Compound fracture and abdominal wounds	34	
Compound fracture and abdominal wounds and burns	1	1
Compound fracture and chest and abdominal wounds	13	
Chest and abdominal wounds	33	2
Post traumatic epilepsy	1	1
Traumatic amputation and burns	2	
Traumatic amputation and abdominal wounds	1	
Traumatic amputation and chest wounds	1	
Traumatic amputation and compound fracture and abdominal wds	1	

Injury

Simple injuries	2603	2
Compound fractures in injuries	548	
Traumatic amputations in injuries	47	
Burns in injuries	153	
Burns and atrophy of liver (acute yellow atrophy)	1	1
Chest wounds in injuries	24	
Chest and abdominal wounds in injuries	3	1
Compound fracture and traumatic amputation in injuries	16	
Abdominal wounds in injuries	20	
Compound fracture and burns in injuries	4	
Compound fracture and abdominal wounds in injuries	5	
Compound fracture , burns, and abdominal wounds	1	
Compound,fracture, traumatic amputation, chest & abd wounds	1	
Compound fracture, chest, and abdominal wounds	1	
Compound fracture, and chest wounds	4	

Records of transfusions are not regularly part of board proceedings and hence we cannot be certain of amounts of blood previously given patients. However, following is listing of patients with jaundice or with diagnosis of hepatitis with or without jaundice and our information regarding transfusions. Those patients from year 1944 and 1945 will have undoubtedly received blood replacement in forward installations if their wounds were at all severe.

Initials	Year	
L.L.	1943	Severe tank burn, died of acute yellow atrophy. Received 7000 cc. of blood at the 12th Gen Hosp.
F.	1943	Mild perforating wound of foot; transferred to ABS with acute hepatitis with jaundice. No blood at 12th Gen Hosp.
J.R.	1943	Severe burn; died with acute yellow atrophy. 8000 cc blood at 12th Gen Hosp.
M.	1943	Post traumatic epilepsy. Hepatitis with jaundice. No. blood at 12th Gen Hosp.
R.	1943	Tank burnsm moderate, recovered and was on L.S. Sent to Z.I. with hepatitis with jaundice. No blood at 12th Gen Hosp.
H.	1944	Maxillofacial injury. Sent to Z.I. with hepatitis, infectious, recurrent with jaundice. No blood at 12th Gen Hosp.
K.	1944	Compound fracture of humerus, with osteomyelitis and radial nerve damage. Sent to Z.I., hepatitis without jaundice. No blood at 12th Gen Hosp but recorded earlier.
B.	1944	Abdominal wound. Sent to Z.I.; hepatitis with jaundice. Received 1000 cc of blood at 12th Gen Hosp.
Y.	1944	Multiple penetrating wounds; reclassified "B". Hepatitis with icterus, severe. No blood at 12th Gen Hosp.
P.E.	1944	Ruptured bladder, acute pulmonary edema. Died. Early hepatitis with icterus. Received 3000 cc blood at 12th Gen Hosp.
U.B.	1944	Severe thoraco-abdominal wound. Died. Hemoglobinuria nephropathy; Received 1500 cc of blood at 12th Gen Hosp.
F.	1945	Fracture of nose. Discharged to A2 duty. Hepatitis, new, infectious with icterus. No blood at 12th Gen Hosp.
B.	1945	Compound fracture of femur. Sent to Z.I. Hepatitis, acute, infectious without jaundice. Received 2000 cc of blood at 12th GH.
R.	1945	Compound fracture of femur. Sent to Z.I. Hepatitis, acute, infectious without jaundice. Received 500 cc of blood at 12th GH.
T.	1945	Several severe compound fractures and other severe wounds. Diabetes. Sent to Z.I. Received 3000 cc of blood at 12th Gen Hosp.
E.J.	1945	Severe thoraco-abdominal wound, right, with marked liver loss; numerous secondary hemorrhages. Icteric from time to time. Liver wound but no hepatitis, infectious.

Of the 16 patients with hepatitis 5 died, all with jaundice. One recovered and in the case of the 5 deaths we have autopsy reports concerning the condition of the liver. Two of the deaths were in patients with severe burns who died with acute yellow atrophy of the liver. They would scarcely be classified as acute infectious hepatitis. One of the deaths was in a patient with ruptured bladder who died of acute pulmonary edema not associated with his bladder rupture. The hepatitis in this case appeared to the prosector to be acute infectious hepatitis

with jaundice. Of the two remaining deaths one patient died of uremia due to hemoglobinuric nephropathy from transfusion. The hepatitis in his case was probably associated with the renal pathology. The last patient was a severe thoraco-abdominal wound with extensive lover damage and microscopic study of the liver did not reveal evidence of acute, infectious hepatitis. Of these 5 deaths then, only 1 was a true infectious hepatitis.

Of 53 autopsies performed on patients of the Surgical Service there were 30 in which the microscopic examination of liver tissue showed any changes noted by the prosector. These changes included acute and chronic passive congestion, fatty degeneration, cloudy swelling, hyperplasia of reticulo- endothelial system, acute hepatitis in sepsis, etc. In but one instance was acute infectious hepatitis found. These 30 cases follow herewith:

(Notes regarding liver pathology as shown at post-mortem in every instance in which the prosector made any notation; in all others liver was reported as normal)

Initials	Dis, BC, Inj	Time elapse	
E.B.	A.I.	28 days	Died 17 Mar 43 of hemorrhagic shock during operation. Severe burn. Micro: Numerous areas of focal necrosis Marked pigmentation of hepatitis perenchyma Diffuse infiltration of sinusoids with polys. Path. Diag: Focal necrosis, mild Hepatitis, acute, diffuse, early Chronic passive congestion.
M.P.	A.I.	10 hours	Died 7 May 43 of extensive brain damage. Severe closed skull injury; no fracture. Micro: Periportal proliferative reaction, monocytic and polys. Mild focal hepatitis, probably normal. Path. Diag: Periportal hepatitis, patchy, mild.
R.C.	A.I.	5 days	Died of subarachnoid and intraventricular hemorrhage Profound intracranial damage. Micro: Minimal fatty degeneration, lymphocytic infiltration of hepatic triad, cloudy swelling. Path. Diag: Mild, fatty degeneration. Periportal hepatitis, chronic, mild.
T.R.	Dis	3 days	Died of shock and acute bacteremia during operation. Ruptured appendicitis. Micro: Several foci of conglomerate tubercles - no significance. Path. Diag: Cloudy swelling, conglomerate miliary tubercles (quiescent).
J.Mc	B.C.	44 days	Died of bronchopneumonia, sepsis and debility. SFW, cord and spine. Micro: Kupfer cell proliferation, pink staining cells with irregular bodies in sinusoids, slight pigmentation. Path. Diag: Cloudy swelling. Diffuse hyperplasia of reticulo-endothelial cells.
P.C.	B.C.	36 days	Died, secondary hemorrhage from chest. SFW, chest and spine. Micro: Marked cloudy swelling, fatty degeneration, slight, early, chronic passive congestion. Path. Diag: As above.

Initials	Dis, BC, Inj	Time elapse	
C.D.	A.I.	14 days	Died, pulmonary fat embolism. Simple fracture dislocation of spine. Micro: Acute passive congestion. Path. Diag: As above.
L.L.	B.C.	117 days	Died of acute yellow atrophy of the liver. Severe burn. Jaundice present. Micro: Massive conglomerate necrosis; "red atrophy" due to hemorrhage into necrotic areas, prior inflammatory reaction brief. Path. Diag: Acute, yellow atrophy.
J.R.	A.I.	100 days	Died of acute yellow atrophy of the liver. Severe burn. Jaundice present. Micro: Not available. Path. Diag: Acute, yellow atrophy of liver.
E.W.	B.C.	10 days	Gas gangrene. Severe SFW, thigh with compound fracture of femur. Micro: Marked, cloudy swelling, Kupfer cells prominent, early, passive congestion. Pathl. Diag: Acute parenchymatous degeneration, proliferation of Kupfer cells, acute, passive congestion.
A.A.	B.C.	11 days	Died, hemolytic transfusion. Penetrating wound of brain. Micro: Excess bile pigment in canaliculi, sinusoids dilated, periportal round cell infiltration, infrequent minute areas of focal necrosis with polymorph infiltration. Path. Diag: Focal necrosis. Proliferation of reticuloendothelial cells.
F.P.	B.C.	12 days	Died of secondary hemorrhage. Severe pelvic wound with erosion into bladder, compound fracture of femur, etc. Micro: Acute, passive congestion about central veins, cloudy swelling, Kupfer cells prominent and sinusoids contain polys. Path. Diag: As above.
L.B.	A.I.	5 days	Died of fulminant bronchopneumonia. Fracture, 4th & 5th cervical vertebrae with severe cord damage. Micro: Acute, passive congestion. Path. Diag: As above.
S.W.	A.I.	2 days	Died of respiratory failure from high cord lesion. Fracture dislocation of 4th cervical vertebra. Micro: Slight degree of cloudy swelling. Kupfer cells unduly prominent. Path. Diag: Proliferation of Kupfer cells.
B.C.	Dis	8 months	Died of purulent meningitis. Focus not located at autopsy; brain abscess probably emptied (?). Micro: Marked, cloudy swelling of liver cells, Kupfer cells unusually prominent, many polys in sinusoids Path; Diag: Hepatitis, acute, diffuse, due to septicemia.

Initials	Dis, BC, Inj	Time elapse	
W.F.	B.C.	106 days	Died; general peritonitis and subphrenic abscess. Thoracoabdominal wound with subphrenic and intraperitoneal abscesses. Micro: Abscess wall formed in part by liver. Chronic periportal hepatitis with some proliferation of bile ducts. Kupfer cells xxxx unduly prominent. Path. Diag: Abscess between liver and diaphragm. Periportal hepatitis, proliferation of Kupfer cells, acute, cloudy swelling.
F.C.	A.I.	5 days	Paralytic ileus. Rupture of sigmoid colon with peritonitis. Micro: Chronic passive congestion and mild fatty degeneration.
			Rome
P.E. HJ	A.I.	18 days	Acute pulmonary edema. Ruptured bladder, mild peritonitis, "flooded with fluids". Jaundice present. Micro: Marked degeneration of central liver cells without necrosis except early bits thrombi in some areas. Path. Diag: Epidemic hepatitis, acute, early, severe.
V.R.	A.I.	2 days	Severe disseminated fecal peritonitis. GSW, perforating, of abdomen, duodenum, jejunum and colon perforations. Micro: Acute, passive hyperemia about central vessels, where liver cells are degenerating, sinusoids wide, distorted and filled with blood. Moderate fatty degeneration. Path. Diag: Fatty degeneration of liver.
A.B.	B.C.	10 days	Died; uremia from transfusion incompatability. Severe SFW, thoraco-abdominal. Jaundice present. Micro: Well marked passive congestion. Rare necrotic cells with Polymorph infiltration, rare small foci of parenchymal necrosis. Path. Diag: Changes may be due to uremia or acute yellow atrophy. Pathologist favors uremia.
S.	B.C.	14 days	Died; sulfonamide nephropathy (and acute gastric dilatation). Sucking wound of chest. Micro: Severe focal necrosis, essentially central and variable in extent. Heavily infiltrated with lymphocytes and polys. Periportal spaces stuffed with lymphocytes and polys. Total picture not that of epidemic hepatitis. Path. Diag: Acute central necrosis of liver, severe.
H.I.	B.C.	13 days	Died; gas gangrene (clostridial myositis- edematiens) Compound fracture, femur and humerus, penetrating wound, chest, etc. severe. Micro: Scattered polys throughout sinusoids, marked cloudy swelling. Path. Diag: Acute, cloudy swelling of liver.
J.B.	B.C.	9 days	Died of pulmonary embolism. Traumatic amputation of leg, multiple, severe wounds. Sulfonamide nephropathy with uremia. Micro: In central portions of lobules cells have disappeared and contain young connective tissue with scattered lymphocytes and occasional macrophages. Path. Diag: Central cirrhosis of liver.

Init- ials	Dis, :BC,Inj:	elapse of Time:	
H.T.	A.I.	23 days	Dies of fulminant bronchopneumonia. Severe cord damage at level of cervical 6. Micro: Marked periportal hepatitis without connective tissue increase; some round cell and polymorph infiltration. Slight passive congestion. Path. Diag: Periportal hepatitis, ancient, mild.
E.D.	A.I.	1½ days	Died; extensive brain damage. Severe cerebral injury plus other wounds. Micro: pigmentation of central liver cells. Miliary tiny foci of necrosis; scattered polys in sinusoids. Path. Diag: Focal necrosis of liver, minimal.
L.C.	B.C.	68 days	Died; ventriculitis, meningitis and brain abscess. Severe, penetrating wound of the brain, with infection. Micro: well marked fatty degeneration of central half of lobule. Path. Diag: Fatty degeneration, moderately severe.
W.B.	B.C.	2 days (pneumonia)	Fulminant lobar pneumonia. Slight wound of wrist, long healed. Micro: Much pigmentation of liver cells centrally. Acute passive congestion. Path. Diag: As above.
W.K.	A.I.	8 days	Lobar pneumonia. Gsw, abdomen, perforating, cecal perforation. Micro: Acute passive congestion and minimal fatty changes. Path. Diag: As above.
			Leghorn
P.S.	A.I.	18 days	Died; subdural hematoma. Closed skull injury. Micro: Mild, acute, passive congestion. Pathl Diag: As above.
E.J.	B.C.	98 days	Died; oxygen deprivation due to lack of lung tissue. Thoraco-abdominal wound with severe liver and chest damage. Jaundice present. Micro: Everything from scar and granulations to near normal liver; capillary dilatation, central necrosis, monocytes filled with pigment, necrosis alternate with regeneration. Path. Diag. Granulating wound of right lobe of liver.