

Please complete the enclosed exercises prior to the session. The exercises were selected from the CSv2 Training materials. We chose to only send exercises 5 and 7.

Hepatobiliary Case # 5

| | | | |
|------------------------|----------|-----------|-------|
| Lymph % | 25.0 | 25-40 | % |
| Mono % | 4.6 | 0-10 | % |
| Eosinophil % | 3.1 | 0.0-8.0 | % |
| Basophil % | 1.0 | 0-2 | % |
| Gran # | 2.8 | 1.4-8.7 | K/uL |
| Lymph # | 1.0 L | 1.2-3.5 | K/uL |
| Mono # | 0.2 | 0.1-0.8 | K/uL |
| Eos # | 0.1 | 0.0-0.4 | K/uL |
| Baso # | 0.0 | 0.0-0.1 | K/uL |
| Albumin – Serum | 4.7 | 3.5-5.2 | g/dl |
| Bilirubin, Total | 0.8 | 0.1-1.0 | mg/dl |
| Bilirubin, Direct | 0.2 | 0.0-0.2 | mg/dl |
| AST (SGOT) | 103 H | 0-31 | U/L |
| ALT (SGPT) | 154 H | 0-31 | U/L |
| Alkaline Phosphatase | 100 | 45-130 | U/L |
| Protein, Total | 7.3 | 6.0-8.4 | gm/dl |
| Prothrombin Time | 12.7 | 10.1-13.0 | sec |
| AFP, Alpha Fetoprotein | 74,000 A | 0-8.5 | ng/ml |

OPERATIVE REPORT

Date: 03/06/2010

Preoperative Diagnosis: Fibrolamellar Carcinoma of the Liver.

Postoperative Diagnosis: Fibrolamellar Carcinoma of the Liver

Procedure: Extended Right Hepatectomy

Indication for Surgery: The patient is a XX-year-old female with a large right lobe liver mass. Resent Alpha Fetoprotein -74,000.

Procedure in Details:

After the patient underwent general endotracheal anesthesia, she was prepped and draped using a sterile procedure. A chevron incision was made with a 10 blade scalpel. The Bovie was used to incise through the subcutaneous tissue, abdominal wall, muscle, and fascia. The ligamentum teres was clamped with two Kelly clamps and divided and ligated with 0 silk ties. The falciform ligament was taken down using the Bovie. Adhesions from the colon to the gallbladder were taken down using the Bovie. The Thompson retractor was put into place.

The right lobe of the liver was mobilized, taking down the right triangular ligament. There were large vascular bundles going to the tumor from the diaphragm which were ligated with 2-0 silk ties and transected with Metzenbaum scissors. The gallbladder was removed using the Bovie. The cystic duct and cystic artery were individually ligated with 2-0 silk ties.

The right lobe of the liver was mobilized off of the vena cava by ligating the short hepatic vein until the right hepatic vein could be identified, and it was clamped with a small Satinsky clamp. The clamp was then removed until hilar dissection was completed. The right hepatic duct was identified and ligated with 2-0 silk ties and transected along with a segment 4 duct which was ligated with 2-0 silk ties and transected. The right hepatic artery was ligated with 2-0 silk ties and transected. The right branch of the portal vein was clamped between two vascular clamps

Hepatobiliary Case # 5

and divided with Metzenbaum scissors with each side oversewn with 4-0 Prolene suture. The vascular clamps were then removed. The right hepatic vein was then clamped again with the Satinsky clamp which remained in place. The argon beam coagulator was used to score the liver, just to the right of the falciform ligament and dissection was performed in the umbilical fissure, taking down all of the vascular and biliary branches to segment 4, ligating them with 2-0 silk ties and transecting them with argon beam coagulator. The remainder of the parenchymal dissection then proceeded through the caudate lobe with the argon beam coagulator and finger fracture with the right angle ligating vascular bundles with 2-0 silk ties. The middle hepatic vein was identified. It was clamped with a Satinsky clamp and divided with Metzenbaum scissors and the right hepatic vein was then divided with Metzenbaum scissors, and the right lobe of the liver was removed from the field. The middle hepatic vein stump and right hepatic vein stump were oversewn with running 4-0 Prolene sutures. The clamps were removed, and there was no bleeding. The cut edge of the liver was cauterized with the argon beam coagulator and then sprayed with Tisseel after inspecting for bile leaks and a large piece of NuKnit placed over the cut surface of the liver. The retractor and the laparotomy pads were then removed. The fascia was closed in 2 layers of running #1 PDS. The skin was closed with 4-0 PDS subcuticular sutures. Steri-Strips and a sterile dressing were applied. The patient tolerated the procedure well without complications.

PATHOLOGY REPORT

Date: 03/06/2010

Clinical: Liver Mass

Procedure: Extended Right Hepatectomy

Specimen:

1. Falciform ligament.
2. Gallbladder.
3. Liver lobe with mass.

Final Diagnosis:

1. Fragments of Benign Fibroconnective Tissue
2. Sections of Gallbladder without significant pathologic change
3. Portion of Liver showing a Hepatocellular Carcinoma fibrolamellar type measuring 13.5 cm in maximum dimension.

Gross:

1. Received in formalin are two fragments of rubbery, lobulated, yellow tissue resembling fat, with 3.5 x 1.5 cm white to light gray connective tissue, resembling a ligament. Representative sections are submitted in a single cassette.
2. Received in formalin is a 6 x 2.2 x 0.7 cm open gallbladder. The serosa is pink to light green. The wall measures 0.2 cm in maximum thickness. The mucosa is green and velvety. No stones are identified. Representative sections are submitted in a single cassette
3. Received fresh is a 1,386 gm, 19 x 14 x 9 cm liver lobe with a 13.5 x 12 x 5 cm mass. The external surface is red-brown and smooth. The surgical margins are inked black. In the posterior

Hepatobiliary Case # 5

wall, adjacent to the gallbladder impression, is the previously described large mass. Cut surface of the mass is yellow, lobulated, rubbery and soft, surrounded by a capsule, and is 0.7 cm from the surgical margin.

1. Fragments of benign fibroconnective tissue
2. Sections of gallbladder without significant pathologic change
3. Portion of liver showing a hepatocellular carcinoma, fibrolamellar type, measuring 13.5 cm in maximum dimension.

Comment: There are areas with intersecting fibrous bands. However, in other areas there are no fibrous bands and intermediate grade histology. These areas would be consistent with this patient's markedly elevated AFP levels, and may be associated with a more guarded prognosis than with the more typical fibrolamellar type of hepatocellular carcinoma.

4. No lymphovascular space invasion identified
5. Tumor is present 7 mm from the surgical margin of resection.
6. There is associated steatosis present
7. Sections of liver, away from the tumor, show no evidence of cirrhosis or active hepatitis.

AJCC Stage: pT1 NX MX

Hepatobiliary Case # 7

DISCHARGE SUMMARY

Date of Admission: 05/23/2010

Date of Discharge: 05/30/2010

Principal Diagnosis: End Stage Liver Disease secondary to Hepatitis C

Secondary Diagnoses: Hepatocellular Carcinoma; History of Hepatitis C

History of Present Illness: The patient is a XX-year-old woman with a history of end stage liver disease secondary to hepatitis C and Hepatocellular Carcinoma who was transferred from outside hospital for encephalopathy. The patient is currently being worked up for liver transplant. The patient currently complains of vomiting and encephalopathy. The patient was admitted, continued LPS workup and was begun on lactulose enemas. The patient was seen by hepatology in order to manage her continuing encephalopathy.

Hospital Course: The patient continued preoperative work up and on 05/23/2010 underwent a liver transplant. The patient tolerated the procedure well, without any complications. The patient postoperatively was taken to the ICU for further care. The patient's stay in the ICU was uneventful. She was extubated on postoperative day number one. Liver transplant ultrasound showed no evidence of any hepatic dilatation. She remained otherwise well. The patient's pressors were weaned off at this time. The patient continued to progress well and appropriately and denied any other complaints. The patient was eventually transferred out of the ICU on postoperative day # 3. The patient's stay on the floor was uneventful. The patient remained afebrile and hemodynamically stable. It should be of note that the patient did have an increase in her T bili count. An ultrasound was done which showed hepatic biliary duct dilatation. The patient had an ERCP done which showed evidence of possible small contained leak. The patient had a sphincterotomy and eventual stent placement on a repeat ERCP there was done. The patient tolerated this well and T bili continued to trend down. The patient had no evidence of any pancreatitis and her laboratory values did improve after this procedure. The patient was otherwise doing well on date of discharge and has had pain well-controlled with oral pain medication, laboratory enzymes have been well and the patient has been appropriately followed. The patient was discharged in satisfactory condition

LABORATORY REPORTS

Date: 05/14/2010

| | | | |
|-------------------------------|-------|---------|-------|
| CA 19-9 | 16.6 | 2-40 | U/mL |
| AFP, Alpha Fetoprotein | 474 H | 0-8.5 | ng/ml |
| Comprehensive Metabolic Panel | | | |
| Glucose | 109 | 70-110 | mg/dl |
| Urea Nitrogen (BUN) | 17 | 6-20 | mg/dl |
| Creatinine | 0.3 L | 0.5-1.4 | mg/dl |

RADIOLOGY REPORT

Hepatobiliary Case # 7

Date: 05/08/2010

CT Scan of the Chest with contrast
CT Scan of Abdomen with and without contrast

Findings:

Chest: Examination of the soft tissue and vascular structures at the base of the neck is unremarkable. The heart is not enlarged, and there is no evidence of pericardial fluid or disease. The hilar region demonstrates normal contours, and no abnormally enlarged mediastinal or hilar lymph nodes are identified. The aorta is normal in course in a caliber, with mild atherosclerotic calcification identified through its course and within its visualized branches.

Abdomen: The stomach, small bowel, spleen, pancreas, gallbladder, and adrenal glands are normal in appearance. The visualized loops of large bowel are of normal caliber, with no evidence of bowel obstruction. The kidneys are normal in size and position, and concentrate and excrete contrast materials satisfactorily on delayed imaging. The liver is significantly heterogeneous in appearance and demonstrates a lobulated contour, a finding consistent with the patient's given history of cirrhosis. Additionally, arterial phase images demonstrate two subcentimeter hyperdense lesions in the right hepatic lobe, and a heterogeneous (predominantly hypoattenuating) lesion in the posterior right hepatic lobe. These are concerning for multifocal Hepatocellular Carcinoma in this patient with history of cirrhosis. Venous phase images demonstrate two separate subcenter hypodense lesions in the right hepatic lobe. The heterogeneous larger lesion in the posterior right hepatic lobe described on initial arterial phase images is again seen and measures 4.0 x 3.1 cm. Again, this is concerning for multifocal Hepatocellular Carcinoma. The portal vein, IVC, and SMV are patent. There is no evidence of ascites or abnormal lymph node enlargement. Bone windows reveal no acute fracture, dislocation or osseous destructive processes.

Impression:

1. Heterogeneous appearance of the liver parenchyma, which also demonstrates a nodular contour. There are several subcentimeter hyper and hypodense lesions in the right hepatic lobe seen on arterial and venous phase images. Additionally a heterogeneous 4.0 x 3.1 cm lesion is seen in the posterior right hepatic lobe, as described above. There are concerning for multifocal Hepatocellular Carcinoma in this patient with the given history of cirrhosis.
2. No additional abnormalities identified

OPERATIVE REPORT

Date 05/23/2010

Preoperative Diagnoses: Hepatitis C; Cirrhosis; Hepatocellular Carcinoma
Postoperative Diagnoses: Hepatitis C; Cirrhosis; Hepatocellular Carcinoma

Procedure: Orthotopic Liver Transplant

Hepatobiliary Case # 7

Indications: The patient is a XX-year-old female with end-stage liver disease secondary to chronic hepatitis C. The patient also has history of x-ray findings consistent with Hepatocellular Carcinoma. The patient was placed on the transplant list. When appropriate organ became available, the decision was made to proceed with transplantation. The operation began with bench preparation of the allograft.

Procedure in Detail: The patient was brought to the operative suite and after endotracheal intubation induction with general anesthetic, access lines were placed and the abdomen was prepped and draped in usual sterile fashion. Bilateral subcostal incision was made with a 10 blade and dissection was carried down through the subcutaneous tissues and the abdominal wall muscle using cautery. The peritoneum was entered and a large amount of ascites was encountered. The round ligament was identified and divided between ties. The abdomen was thoroughly explored for any evidence of metastatic or extrahepatic Hepatocellular Carcinoma. The exploration was normal. Falciform ligament was divided using cautery. The left round ligament was divided using cautery. The gastrohepatic ligament was divided using cautery. The Thompson retractor was placed to facilitate exposure. The left hepatic artery was identified and divided between ties and a segment four branch hepatic artery was identified and seen ties cystic artery and duct were identified and between ties. The common hepatic duct was identified and divided between ties. The right hepatic artery was identified and divided between ties. Portal vein was skeletonized. The vena cava was dissected from the level of the renal veins to the diaphragm. The right triangular ligament was divided using cautery. The right adrenal vein was identified and divided between ties. Vascular clamps were placed on the vena cava and portal vein, as well as on the subhepatic vena cava and once hemodynamic stability was achieved, the liver was excised. This caval stumps repaired in the usual fashion. The liver was brought to the operative field and the subhepatic caval anastomosis performed using 3-0 Prolene suture in a running fashion. Then, 750 mL of iced albumin was infused into the liver via the portal vein. The infrahepatic caval anastomosis performed using 4-0 Prolene suture in a running fashion. The portal venous anastomosis performed using 5-0 Prolene suture in running fashion leaving a growth stitch. The liver was reperfused well. Hemostasis obtained with temporary packing and suture ligatures, as well as cautery. The celiac artery of the donor was then anastomosed to a branch patch of the right and left hepatic arteries of the recipient using 6-0 Prolene suture in running fashion. Liver was reperfused well. The artery had a good thrill and good Doppler signals could be heard in both lobes of the liver. The gallbladder was excised and the bile duct was trimmed on the donor allograft. At this point, the common bile duct of the donor was anastomosed to the common hepatic duct of the recipient using 6-0 PDS in running fashion. The donor duct was a smaller caliber than the recipient duct. Once this anastomosis was completed, the abdomen was irrigated with antibiotic irrigation. Hemostasis was assured and the fascia was closed in 2 layers using #1 PDS suture. Three Jackson-Pratt drains were left. The skin was proximal with skin clips. Sterile dressings were placed. The patient was taken to the ICU in critical but stable condition

PATHOLOGY REPORT

Date: 05/23/2010

Clinical: End-Stage Liver Disease

Procedures Liver Transplantation with Recipient Liver Biopsy and Donor Liver Biopsy

Hepatobiliary Case # 7

Specimen: 1. Recipient Liver. 2. Donor Liver Biopsy

Final Pathology Diagnosis:

1. Liver, explant: Moderately-Differentiated Carcinoma with Features of Hepatocellular Carcinoma, present at multiple foci ranging from 2.7 to 0.2 cm grossly. Over 15 separate tumor nodules are identified. No lymphovascular invasion seen. Porta hepatis and margins are negative for tumor. Background of chronic hepatitis C with mild activity and cirrhosis. Gallbladder is unremarkable.

2. Donor Liver, needle biopsy: Microvesicular steatosis 15%. No inflammation or fibrosis. Iron stain is negative.

Comment: The tumor is multifocal. In some areas there is gland formation. In these areas, the tumor is negative for hepatocyte antigen and positive for keratin 7, indicating a bile duct differentiation. The majority of the tumor does show hepatocellular differentiation. PAS-D stain is negative in the explanted liver with rare copper positivity. Special stains and immunostains performed with appropriate positive and negative controls.

Gross:

1. Received fresh is a 902 gm, 19 x 13.5 x 7.3 cm liver with attached gallbladder measuring 9.5 x 5.5 x 3.7 cm. The external capsule in the liver parenchyma has multiple well-defined, green nodules. Between the nodules are firm, tan areas of fibrous tissue. Also there are multiple dominant nodules in the cut surface of the right side ranging from pinpoint to 2.7 x 2.5 x 2.5 cm to 0.2 cm. The cut surfaces of the nodule are lobulated, yellow to tan. Also the cut surface of the left side of the liver has multiple ill-defined, yellow to green nodules, ranging from 0.2 to 0.7 cm. Over 15 nodules are grossly identifiable.

2. Received in formalin is a soft, cylindrical, tan needle biopsy fragment measuring 1.5 cm. Submitted as received.

| FIELD NAME | CODE | RATIONALE/DOCUMENTATION |
|-------------------------|-------------|--------------------------------|
| Patient Name | Case 5 | |
| Sequence | | |
| Primary Site | | |
| Histology | | |
| Behavior | | |
| Sequence | | |
| Grade | | |
| Grade system type | | |
| Grade system value | | |
| Lymph-vascular invasion | | |
| CS Mets at Dx - Bone | | |
| CS Mets at Dx - Lung | | |
| CS Mets at Dx - Liver | | |
| CS Mets at DX - Brain | | |
| CS Tumor Size | | |
| CS Extension | | |
| CS Tumor Size/Ext Eval | | |
| CS Lymph Nodes | | |
| CS Lymph Nodes Eval | | |
| Regional Nodes Positive | | |
| Regional Nodes Examined | | |

CS Mets at Dx

CS Mets Eval

CS Site-Specific Factor 1

CS Site-Specific Factor 2

CS Site-Specific Factor 3

CS Site-Specific Factor 4

CS Site-Specific Factor 5

Diagnostic Staging
Procedure

Surgery of Primary Site

Scope of Regional
Lymph Node Surgery

Chemotherapy

Hormone

Immunotherapy

| FIELD NAME | CODE | RATIONALE/DOCUMENTATION |
|----------------------------|--------|-------------------------|
| Patient Name | Case 7 | |
| Sequence | | |
| Primary Site | | |
| Histology | | |
| Behavior | | |
| Grade | | |
| Grade system type | | |
| Grade system value | | |
| Lymph-vascular invasion | | |
| CS Mets at Dx - Bone | | |
| CS Mets at Dx - Lung | | |
| CS Mets at Dx - Liver | | |
| CS Mets at DX - Brain | | |
| CS Tumor Size | | |
| CS Extension | | |
| CS Tumor Size/Ext Eval | | |
| CS Lymph Nodes | | |
| CS Lymph Nodes Eval | | |
| Regional Nodes Positive | | |
| Regional Nodes Examined | | |
| CS Mets at Dx | | |

CS Mets Eval

CS Site-Specific Factor 1

CS Site-Specific Factor 2

CS Site-Specific Factor 3

CS Site-Specific Factor 4

CS Site-Specific Factor 5

Diagnostic Staging
Procedure

Surgery of Primary Site

Scope of Regional
Lymph Node Surgery

Chemotherapy

Hormone

Immunotherapy