ORIGINAL ARTICLES

AUDIT OF LIVER RESECTIONS IN ARMY LIVER TRANSPLANT UNIT

Ammad Ud Din Nasir, Anas Bin Saif*, Qasim Butt, Hanif Abbasi, Muhammad Shoaib Khan, C. Aqeel Safdar

Pak Emirates Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Combined Military Hospital Kohat Pakistan

ABSTRACT

Objective: To evaluate the types of liver resections performed for various liver diseases and assess the overall outcome in a series of patients presenting to Army Liver Transplant Unit, Pak Emirates Military Hospital.
Study Design: Retrospective observational study.
Place and Duration of Study: This study was carried out in Army Liver Transplant Unit – Pak Emirates Military Hospital Rawalpindi, from Dec 2015 to Dec 2016.
Material and Methods: All patients who underwent any type of liver resection were included by non-probability convenient sampling. History, clinical findings, radiological variables and histological findings were recorded in a proforma based on hospital database. The data was analyzed using SPSS 17.
Results: A total of seventeen patients underwent various forms of liver resections out of which there were thirteen males and four females. The mean age of patients was 40.4 ± 21.4 years. Nearly half of patients had chronic, hepatitis either hepatitis C (35.3%) or chronic hepatitis B (11.8%). Most patients were asymptomatic (42%) and were diagnosed on routine screening by transabdominal ultrasound followed by pain (23%), mass abdomen (17%) and jaundice (12%). The average size of mass was 5.1 x 5.2 cms on CT scan. The most common tumor in adults was hepatocellular cancer (8 cases) whereas hepatoblastoma (3 cases) was common in children. Two resections were performed for giant hemangioma. Non-anatomical resection was performed in 8 cases followed by left lateral segmentectomy (5 cases) and right hemihepatectomy (3 cases) and right extended hepatectomy (1 case). There was bile leak in one case and recurrence in two cases. There was one peroperative mortality because of massive bleeding.
Conclusion: Liver resections are among one of the complex surgical procedures which can be performed safely in specialized centers. Most commonly resections were performed for malignant diseases in pediatric and adult population but symptomatic benign diseases can also be resected with better outcomes.

Keywords: Chronic hepatitis, Hemangioma, Hepatectomy, Hepatocellular cancer, Radiologic imaging.

INTRODUCTION

Liver is the largest solid organ of body divided morphologically in two, right and left, lobes and functionally into eight Couinaud segments. The hepatic veins are present at the margin of each segment, whereas the center has branches of the portal veins, hepatic arteries, and bile ducts[1]. Liver tumors are the sixth most common cancer occurring worldwide with incidence of about half a million cases annually[2]. It stands as third most common cause of cancer related deaths globally and is endemic in developing countries[3]. In Pakistan, liver related primary tumors have incidence of 7.64/100000 in males and 2.8/100000 in females[1]. The most common liver tumor is hepatocellular carcinoma (HCC) accounting for 80% of total primary tumors followed by cholangiocarcinoma[4]. In children hepatoblastoma is the commonest hepatic lesion. Moreover, tumors that metastasize to liver are more common than the primary cancers[5]. Various risk factors have been attributed to occurrence of liver cancers with chronic hepatitis C and B as the most common followed by aflatoxins, obesity and alcoholism[6]. Hemangiomas are the most common benign liver tumors with female preponderance common in child bearing age. Pyogenic liver abscess once thought to be lethal spreads mostly by hematogenous source[7].

Correspondence: Dr Anas Bin Saif, House No 211, Street No. 06, Sector-A Askari-14 Rawalpindi Pakistan
Email: anasbinsaif02@gmail.com
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Diagnosis of liver cancers occur usually late when the disease is beyond cure. Most patients are asymptomatic or have vague complaints of malaise and anorexia. Some present with constitutional symptoms and complications of chronic hepatitis. In children abdominal mass is the most common complaint. Tumor markers such as alpha-feto protein is usually elevated but not in all cases[1]. Contrast enhanced Triphasic CT is usually diagnostic in HCCs, for lesions more than 2cm in size[8]. Some space occupying lesions may present as diagnostic dilemma and may need MRI/biopsy for establishing diagnosis.

Treatment of liver tumors is rarely curative due to late diagnosis with survival rate less than 5% in five years[1]. Surgery is curative, other options include Trans Arterial Chemembolization, Radio Frequency Ablation (RFA) and percutaneous ethanol injection, depending on site, size and number of tumors. Treatment of most hemangiomas and liver abscess is non-surgical except for large hemagiomas (>10cm) and recurrent multiloculated large abscess[6,9].

Our study aimed at identifying indications, clinical presentation, radiological findings and types of liver resections performed. Patients were closely followed for 6 months to assess post-operative morbidity and mortality.

PATIENTS AND METHODS

With the approval of ethical committee, Pak Emirates Military Hospital Rawalpindi, this retrospective observational study was carried out from December 2015 to December 2016. All the patients who had undergone liver resection for either benign or malignant diseases were included in the study after the informed consent. The data was collected by non-probability convenient sampling. The patients who had primary liver pathology were included in study. All the patients underwent ultrasonography followed by contrast enhanced CT-scan and some had undergone MRI and endoscopic ultrasound (EUS) in case of diagnostic uncertainty. Patients who had extrahepatic malignancy and those in which surgery was not performed were excluded. A protocol proforma was designed based on hospital computerized data base to include particular of the patients, initial signs and symptoms, relevant diagnostic results and histopathology reports, pre-operative clinical findings, radiological studies, operation notes and post-operative follow up. Follow up was done till six months for post-operative morbidity and mortality. The data collected was plotted in SPSS 17 and analyzed to calculate the frequencies of gender, type of tumor, surgical procedure performed and complications. The data was also used to find the mean age and size of tumors with standard deviation.

RESULTS

A total of 17 patients were included in the study, 13 were males (76.4%) and 4 were females (23.5%) as shown in fig-1. Age of patients ranged from 10 months to 67 years with mean age of 40.4 ± 21.4 years. Seven patients (41.1%) were above 50 years of age. In case of malignant tumors,

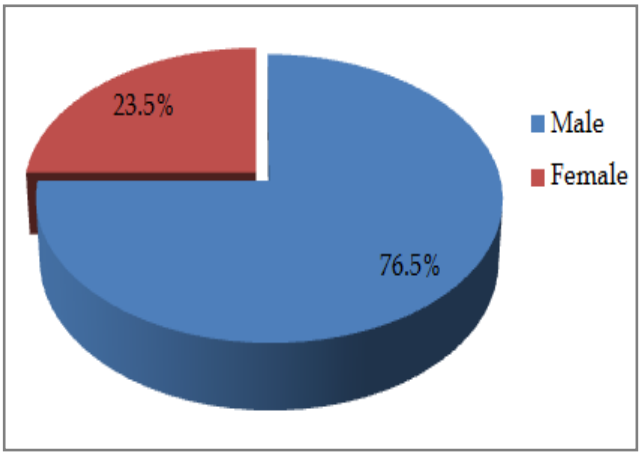

Figure-1: Showing percentage of gender who underwent various liver resections.

there was chronic hepatitis present in 8 cases (47%). Five patients had hepatitis C (29.4%) and two had hepatitis B (11.7%) whereas one case had co-infection of hepatitis B and C (5.8%). The same patient also had diabetes mellitus and hypertension.

Eight patients were asymptomatic initially and six were diagnosed with HCC and two as cholangiocarcinoma (diagnosed on biopsy) during screening or incidentally. There was dragging pain in four cases (23.5%), mass in upper

abdomen in three cases (17.6%), two patients had jaundice (11.7%) and one had fever (5.9%) at time of presentation. The most common sign was pallor present in 10 patients (58.8%), followed by mass in 3 cases (17.6%) tenderness in right hypochondrium, jaundice in two (11.7%) and signs of sepsis (5.9%) in one case.

Pre-operative ultrasonography and contrast CT was done in all cases. The average size of mass was 5.27 ± 3.72 cms x 5.20 ± 4.35 cms (length x breadth). In adults the most common tumor was HCC (47%) followed by cholangiocarcinoma (11.7%) and metastatic disease in one patient from Pancreatic Neuroendocrine Origin (5%) shown in fig-2. Liver hemangioma was diagnosed in two patients (11.7%) with average size of 7.75 cm x 7 cm and in children all three had hepatoblastomas (17.6%). The percentages of various tumors is given shown in fig-2.

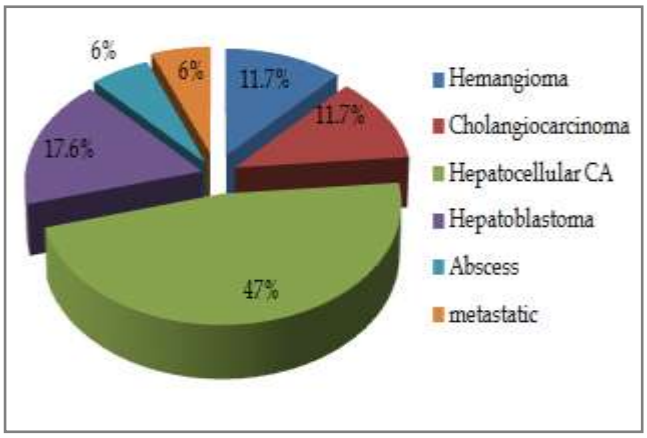

Figure-2: The pie chart showing percentage of liver resections performed for various indications.

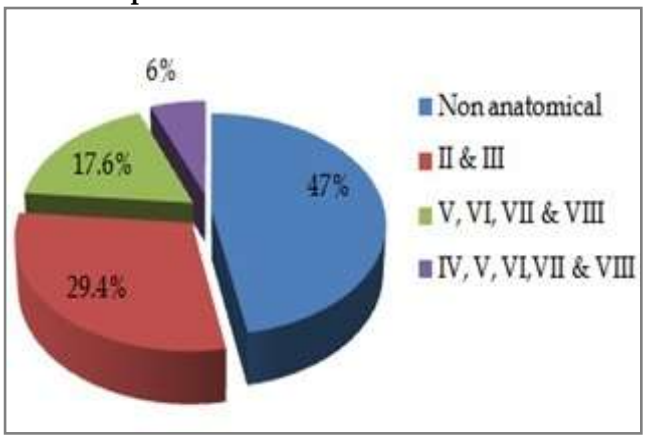

Figure-3: The pie chart showing percentage of various types of liver resections.

In 9 cases right lobe of liver (53%) was involved and 8 had disease in left lobe (47%). Surgical procedures performed included non-anatomical resection (47%), Left lateral segmentectomy (segment II and III) (29.4%), Right formal hemihepatectomy (17.6%) and Right extended hemihepatectomy in one case (5.9%) illustrated in fig-3. Average hospital stay was 8 ± 3 days. There was recurrence of disease in two cases and bile leak in one case. There was one mortality due to excessive bleeding per-operatively in case of hepatoblastoma.

DISCUSSION

Liver resections have gained popularity in the last two decades and are increasingly being performed even for metastatic lesions[10]. Liver Tumors can be of primary hepatic origin or they may be secondary from some other source. Secondary or metastatic lesions are far greater as compared to primary tumors[11,12]. Among primary tumors HCC accounts for 75-80% of total tumors[2]. This was also observed in our study where 60% of surgeries in adults were performed for HCC. All patients were in Child A. Cholangiocarcinoma stands second in malignant tumors. Because of advance size of HCC and high Child score only a few were amenable to resections[13]. There was one case of metastatic tumor from pancreas which was neuroendocrine in nature, in which single stage tumor resection along with metastatectomy was done. The less number of cases undergoing resections for secondary hepatic tumor can be explained by late presentation of cases with advanced carcinomas beyond resection.

In children, the most common liver tumor that requires surgery is hepatoblastoma[14,15]. In our study all three pediatric tumors were hepatoblastoma. The hemangioma of liver was the only benign tumor in which resections were done. Both were young females in their reproductive ages with inconsistent history of oral contraceptive pills. These findings are in coherence with

research done by Liu *et al*[16] and Qiu *et al*[17]. There was one large abscess occupying the left lobe in which left lateral segmentectomy was done after conservative therapy failed. Most of liver abscesses can be managed conservatively with repeated aspirations or indwelling catheter however recurrence and multi-loculations may warrant surgical intervention[6,18].

Liver tumors especially HCC are endemic in Pakistan and although a lot of effort has been put in on cause and associations of HCC, however, a limited research is available on the treatment of HCC. One series by Yusuf *et al* showed that out of 584 cases of HCC only 14 underwent different sort of liver resections[19]. Such large number of resections in small time in our setup can be due to fact that our hospitals, a tertiary care center of Pakistan army and receive shepatobiliary cases from whole country. In addition, being a government supported set up all relevant investigations and prompt management is done without any cost.

Butt *et al* and her colleagues found that in Pakistan Hepatitis C and male gender is more common cause of HCC[2]. This is also consistent with our findings in which hepatitis C was present in 6 out of 8 patients of HCC and all were males. Similarly 75% of cases of HCC were in fifth and sixth decade of their life at time of presentation. Similarly, Herszényi *et al* found old age, Diabetes and male gender as risk factor for HCC[20].

Most of the patients were asymptomatic at the time of presentation for malignant cases and 70 percent were diagnosed incidentally or during routine screening by ultrasonography. This emphasizes the need to establish a proper screening protocol for high risk cases especially in males with chronic hepatitis. The average tumor size of malignant tumors was 3.30 ± 0.45 cms which could be resected easily and therefore non-anatomical resection was the commonest procedure followed by left lateral segmentectomy. Internationally Belghiti *et al* showed that limited resection and segmentectomy has benefit of preserving the liver parenchyma thus preventing post-operative liver failure[21].

HCC and Cholangiocarcinoma have very high recurrence, as much as 80% in five years[12]. We had two recurrence of HCC in six months follow up. In addition there was bile leak in one case of extended right hemihepatectomy for hepatoblastoma which was managed conservatively and settled in four weeks post operatively. Two patients developed ascites post operatively after liver resection for HCC on background of cirrhosis, which also settled by medical management. There was one mortality because of massive per-operative bleeding due to involvement of inferior vena cava within tumor mass.

CONCLUSION

Liver resections are among one of the complex surgical procedures which can be performed safely in specialized centers. Most commonly resections were performed for malignant diseases in pediatric and adult population but symptomatic benign diseases can also be resected with better outcomes.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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