

Hepatectomy Experience in Baghdad Teaching Hospital

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ABSTRACT:

BACKGROUND:

Hepatectomy is usually performed because it is the most effective way of removing liver tumour(s). Cryosurgery, Radiofrequency, Laser, Microwave and Chemo-therapies are less effective alternatives.

OBJECTIVE:

To review the experience of hepatectomy in Baghdad Teaching Hospital – Medical city,Iraq with a review of the obstacles and needs for promotion and development.

PATIENTS AND METHODS:

During the period from March 1999 to September 2005, Out of 27 patients admitted to the second surgical unit in Baghdad Teaching Hospital – Medical City with liver tumours, 15 had hepatectomy done by the same surgical team. The remaining 12 cases were beyond resection.

RESULTS:

The age of patients ranged from 2 to 65 years old with mean age of 34.4 years. Only one (6.7%) patient underwent left lobectomy, 2 (13.3%) left segmentectomy, while the rest 12 patients (80%) underwent right partial or total lobectomy, divided equally between anatomical & non-anatomical resection. Two main techniques were used in transection of liver parenchyma: CUSA Dissector which is used in 9 patients (60%) and clamp-crushing or finger fracture technique was used in the remainder. In addition to CUSA knife, argon beam was used in 5 cases (33.3%). Postoperative mortality rate was 26.7% (4patients).

The histopathological examination of resected segments of the liver revealed 11 (73.3%) cases of hepatocellular carcinoma, 2 (13.3%) of hepatoblastoma, 1 (6.7%) case metastatic colorectal carcinoma, and 1 (6.7%) case of benign cells (haemangioma).

CONCLUSION:

Hepatectomy for liver tumours can be performed with acceptable safety and efficacy in a suitably staffed and equipped center. The outcome will improve with time and experience.

KEY WORDS: hepatectomy, liver tumour, hepatocellular carcinoma (HCC).

INTRODUCTION:

The first recorded successful elective resection of a liver tumour in the United States was performed by Tiffany in 1890 followed in 1891 by Lucke in Europe⁽¹⁾. The first planned anatomic resection of a lobe of a liver is credited to Lortat-Jacob, who in 1952 performed a right lobectomy as treatment for metastatic colonic cancer⁽²⁾. Major hepatectomies, however, did not become commonplace until the 1980s.

Couinaud's described the segmental liver anatomy in 1954 based on portal venous inflow and hepatic venous outflow, and the identification of the eight hepatic segments, which became the key steps in the development of safe, anatomic hepatic resections⁽³⁾.

Hepatectomy may be indicated for benign and both primary and secondary malignant tumours of the liver. When the tumour is small or deemed surgically resectable, and the patient's liver condition is deemed

fit for the extent of the planned resection, surgical removal offers the best chance for long-term survival⁽⁴⁾. Many special instruments have been proposed for use in parenchymal transection, including electrocauteries, ultrasonic dissectors (CUSA Knife), and water-jet dissectors. It has been found that for the majority of hepatic resections, clamp-crushing (or finger fracture) technique is the most rapid method and is quite safe. In patients with normal liver parenchyma, most experienced hepatic surgeons use blunt dissection to transect the liver tissue⁽⁵⁾.

PATIENTS AND METHODS:

27 patients admitted to the second surgical unit in Baghdad Teaching Hospital – Medical City, with liver tumours in the period from March 1999 to September 2005. Detailed history, clinical examination and evaluation by full hematological, biochemical and imaging studies were done for all patients to assess the site, size and nature of the tumor with degree of extension.

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Hard evaluation was done trying to have the best pre-operative data to yield an efficient hepatectomy with a safety margin. Out of those 27 patients, 15 had hepatectomy. the remaining 12 were irresectable.

Many methods were used in the transection of liver parenchyma, mainly CUSA Dissector, then, tissue clamping or finger fracture. In addition to CUSA knife, Argon beam was used in some cases. Good monitoring of the patients was done during the post-operative period, some in the ICU and others in the ward. The complications were recorded, and the outcome of hepatectomy.

RESULTS:

The age of patients ranged from 2 to 65 years with mean age of 34.4 years old. Male :female ratio was 1.14:1 Duration of present illness ranges from few days to 3 months but some underwent hepatectomy 2 years after the first presentation (a period through which the patient had received chemotherapy). Blood investigations were done with no specific abnormal findings apart from increased ESR in 10 patients (66.7%) and mildly disturbed LFT (increased liver enzymes) in 3 patients (20%). Virology markers were found positive for hepatitis B in three patient (20%) and two patients (13.3%) for hepatitis C, while the remainder 10 (66.7%) patients did not show evidence of viral infections.

Imaging studies were done for all patients starting with abdominal US then CT scan and MRI, all showed that 8 (53.3%) cases had tumour in the right lobe, in 4 (26.7%) cases, the tumour affect parts of both lobes and only 3 (20%) cases had tumours confined to the left lobe.

The approach was different from patient to another according to the site and size of the tumour. In two cases we used thoraco-abdominal incision. The others had laparotomy, mainly by roof top incision (in 9 cases: 60%) and other 4 (26.7%) cases were approached by extended right Kocher's incision.

According to operative findings, the mostly affected segment of the liver was segment V found in 8 patients (53.3%), while the least affected was segment II in only one patient (6.7%).

Only one (6.7%) patient underwent left lobectomy, 2 (13.3%) left segmentectomy, while the rest 12 patients (80%) underwent right partial or total lobectomy, divided equally between anatomical and non-anatomical resection, (Table 1).

The extra-hepatic spread was found as follows: In 5 cases (33.3%), there were lymph nodes enlargement in porta hepatis, also there was an invasion to the gall bladder in 3 cases, to the diaphragm in one case, to the anterior abdominal wall in one case, and to the IVC in one case.

Two main techniques were used in transection of liver parenchyma: CUSA Dissector and clamp-crushing or finger fracture technique. The first is the main, used in 9 patients (60%), while clamp-crushing or finger fracture technique was used in the remainder. In addition to CUSA knife, argon beam was used in 5 cases (33.3%). Hepatic devascularization was attempted in all cases by portal vein and hepatic artery clamping intermittently during the time of operation. While in 6 cases, caval clamping was attempted intermittently both infra and supra hepatic to control the field.

The duration of the operation differed according to the site, size and extension of the tumour. The shortest operation took around two and a half hours, while the longest was 7 hours, but the peak lies in the duration of 4 hours, (Figure 1).

Postoperative period passed smoothly in 8 patients (53.3%) who stayed in the ward for one week while another patient died in the ward. The remainder 6 patients spent several days in the RCU to control postoperative complications, 3 of them transferred to the ward for another 3 days and then discharged well. The remainder 3 died. The complications were respiratory failure, hepatic failure, brain hypoxia, pulmonary embolism and bleeding, so, postoperative mortality rate was (4 patients) 26.7% (Table 2).

The histopathological examination of resected segments of the liver revealed 11 (73.3%) cases of HCC, 2 (13.3%) of hepatoblastoma, 1 (6.7%) case metastatic colorectal carcinoma, and 1 (6.7%) case of benign cells (haemangioma).

Table 1: Distribution of cases according to the site and type of resection.

| Site | Resection | No. | % |
|----------|----------------|-----|-----|
| Rt. lobe | Anatomical | 6 | 40 |
| | Non-anatomical | 6 | 40 |
| Lt. lobe | Anatomical | 3 | 20 |
| Total | | 15 | 100 |

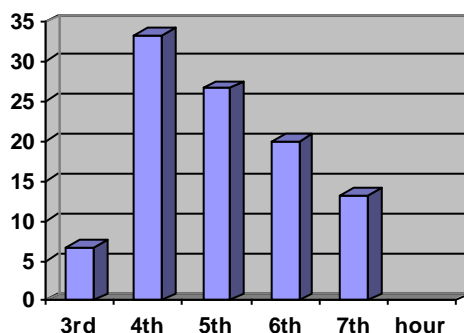


Fig.1: Percents of cases according to the duration of the operation

Table 2: Number of cases with eventful post-operative period and the outcome

| Complication | No. | Outcome |
|---------------------|-----------|--------------------|
| Hepatic Failure | 1 | Died |
| Respiratory Failure | 2 | Healed |
| Pulmonary Embolism | 1 | Died |
| Brain Hypoxia | 1 | Died |
| Bleeding | 2 | 1 Healed 1 died |
| Total | 7 (46.7%) | 4 (26.7%) Died |

DISCUSSION :

The blood tests for viral markers were positive for hepatitis B and C in 33.3% of the patients and this is expected as viral hepatitis is considered to be one of the etiological factors of HCC⁽⁶⁾. There is no definite fact about which type of hepatitis virus more correlated to the etiology of HCC, whereas in some Asian countries, many studies showed a strong coincidence between HBV infection and HCC exists⁽⁷⁾. In Europe and in the United States HCV genotype is more frequently found in patients suffering from HCC⁽⁸⁾. It was difficult to point this in our studies with shortage of laboratory facilities.

We have 4 patients (26.7%) spent six months to two years in receiving chemotherapy either to their primary colorectal tumour and its secondary liver metastases or to the primary tumour of the liver. This is one of non-surgical options to treat liver tumour and decrease its size before hepatectomy. This is compatible with data published recently regarding the effect of neoadjuvant therapy for unresectable primary or secondary liver tumours to downstage the disease. The result was that 10-20% of those patients achieved significant reduction in tumour size and subsequently underwent a potentially curative hepatic resection⁽⁹⁾.

Intra-operatively we found that the right lobe was affected more than the left lobe. The technique of resection was either anatomic (in more than half of the cases) or non-anatomic resection, depending on the nature and extent of the tumour, and the liver

status. In benign lesion, non anatomic resection was carried on, and the same happened for malignant tumours with abnormally looking liver parenchyma, while in malignant tumour with adequate amount of macroscopically healthy liver parenchyma, anatomic resection was done. This is compatible with the fact that anatomic resection permits excision of parenchymal areas distal to the index tumours, where there is a high incidence of vascular micrometastases. In a recent examination of increasing preference for anatomic resections over wedge resections, wedge resections were associated with a 16% rate of positive margins, compared with a 2% rate for anatomic resections⁽¹⁰⁾. But non-anatomic resection is preferred in patients with HCC, viral hepatitis and cirrhosis, in which the smallest resection that achieves complete tumour excision is favored, even if it is a wedge resection, also in benign tumours, the goal of such resections should be to spare as much normal parenchyma as possible⁽¹¹⁾.we used two techniques for parenchymal transection: CUSA Dissector was used in 9 patients (60%), while clamp-crushing or finger fracture technique was used in the remainder either due to unavailability of CUSA dissector or due to technical troubleshooting. In addition to CUSA dissector, argon beam coagulator (ABC) was used in 5 cases (33.3%). While clamp-crushing is rapid and reasonably safe procedure, it is usually not working as well in diseased liver parenchyma this is because

the firmness of the liver substance: the vessels often tear before the parenchyma dose. In many occasions, more than one method was applied in the field.

As regard to the duration of the operation, it was reaching up to 7 hours. In many international studies, there was no concern about the duration of hepatectomy operation. The advances in perioperative management, in combination with new surgical techniques and major anesthetic evolution were the main concerns regardless the time that yield a safe surgery⁽¹²⁾.

8 patients (53.3%) had smooth postoperative period and stayed in the ward for one week while another patient died in the ward due to severe pulmonary embolism ended in his fifth postoperative day. 6 patients (40%) spent several days in the ICU to control postoperative complications 3 of them transferred to the ward for another 3 days and then discharged well, while 3 died and the causes were as follow: One died due to severe brain hypoxia during the operation due to anaesthetic problems, one died due to hepatic failure, and the last died due to severe haemorrhage and inadequate replacement during surgery. So 3 patients died in the RCU and one in the ward, the overall mortality was 4 patients (26.7%). All these events during the postoperative period can happen as hepatectomy is more than a major surgery and many studies state that about 20% of otherwise healthy patients may experience serious postoperative complications after elective hepatectomy⁽¹³⁾.

About three quarters of the patients had HCC, 2 (children) with hepatoblastoma, 1 case of metastatic adenocarcinoma from colorectal tumour, and the last case with benign cells (haemangioma). This is also compatible with the fact that HCC accounts for about 80% of all primary liver tumours⁽¹⁴⁾, where in children the hepatoblastoma is the commonest⁽¹⁵⁾.

CONCLUSION:

Hepatectomy is one of the effective options - if not the most - for treatment of benign and malignant primary or secondary liver tumours especially if other options are not available, and can be performed with acceptable safety and efficacy in a suitably staffed and equipped center. Successful liver surgery represents the culmination of a challenging and often difficult clinical decision process, and, therefore, it is imperative for surgeons to be familiar with current therapies available for these patients and their potential complications.

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