

EXPERIENCE WITH SURGICAL RESECTION OF GIANT HEPATIC HEMANGIOMAS

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Hemangioma is one of the most common tumors of the liver. With the widespread use of abdominal medical imaging, in particular ultrasound, the incidental discovery of liver lesions is not uncommon.¹ In this article, experience with the surgical resection of hemangiomas in both King Khalid University Hospital and King Fahad National Guard Hospital, Riyadh, Saudi Arabia, is described. The diagnostic methods, surgical indication, and the extent of resection are discussed. Recommendations regarding management are highlighted, with special emphasis on the conservative approach for both the indication and the extent of the surgical resection.

Patients and Methods

From January 1997 until July 1999, nine cases of giant hemangioma were treated surgically at King Fahad National Guard and King Khalid University Hospitals. There were seven females and two males, with an average age of 37 years (range, 32 to 48). The main presenting symptom was right upper quadrant pain. All female patients had a history of contraceptive pill use. In one patient, the size of the tumor was followed over a six-year period, with a gradual but substantial increase in its size. All patients underwent radiological investigation, including ultrasound and dynamic axial CT scan. These two tests were enough in all patients to establish the diagnosis with confidence. Two patients had liver biopsies prior to their referral, apparently without adverse consequences. One patient tested positive for hepatitis C without evidence of liver impairment. In two other patients, the tumor was resected when the patients were taken for cholecystectomy. Preoperative liver function tests were normal in all studied patients.

Results

Table 1 illustrates the location of these tumors and the type of resection employed. Formal resection was performed when the hemangioma occupied a large area of

Accepted for publication 11 November 2000. Received 21 December 1999.

one lobe. This was done through a bilateral subcostal incision with midline extension. Hilar dissection was done to gain control of the lobar vascular structure and to transect the respective hepatic duct. Vascular control was also obtained for the respective hepatic vein. Parenchyma dissection was then done along the line of demarcation. This was usually accomplished by the finger fracture technique. Simple inoculation was done safely in one patient only. In another patient, vascular control was obtained through a series of homeostatic sutures in the normal liver tissue, close to the periphery of the tumor. In a third patient, vascular inflow control was done through Pringle's maneuver for 20 minutes, while the tumor was being resected, because of the close proximity of the tumor to the portal vein and the hepatic artery. Blood transfusion was required in three patients; one needed 1 unit and the second needed 2 units. A third patient who underwent right hepatectomy required 6 units of blood because of severe bleeding from a posterior right hepatic vein, which was accidentally avulsed during mobilization of the right liver lobe of the liver. The rest did not require any transfusion.

Morbidity included two patients who had right lower lobe pulmonary atelectasis, and one patient who had a prolonged biliary drainage, which resolved spontaneously two weeks after surgery. The average hospital stay was 12 days. Subsequent follow-up revealed resolution of all symptoms, except for one patient who continued to complain of mild-to-moderate right upper quadrant pain. Liver function tests were normal in all patients after at least six months of follow-up.

Discussion

Liver hemangiomas are usually resected, either for fear of bleeding or because they become symptomatic or both, however, the majority are asymptomatic. Few hemangiomas cause abdominal pain, and a minority have unusual presentations, such as arteriovenous communication or inflammatory changes.² Traditionally, if they attain a size bigger than 4-6 cm they are called "giant" hemangiomas. When such a size is reached, the surgeon's threshold for surgical resection becomes low.

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The diagnosis of a hemangioma is usually easy using ultrasound and dynamic CT scan. In rare instances, RBC radionucleotide scan is needed to confirm the diagnosis. Liver biopsy is not recommended for fear of bleeding,



FIGURE 1. Management of giant hemangioma.

TABLE 1. Anatomical location and the type of resection used in 9 patients.

Age/Sex	Site and size	Type of resection
48/female	18 cm in segments 6, 7 and 8	Right hepatectomy
31/female	12 cm in segments 6 and 7	Right hepatectomy
37/female	11 cm in segments 5 and 6	Right hepatectomy
36/female	11 cm in segment 6	Segmentectomy
43/male	18 cm in segments 3, 4, 5, 6 and 7	Non-anatomical resection
48/female	9 cm in segments 6 and 7	Bisegmentectomy
31/male	7 cm in segment 4	Non-anatomical resection
34/female	8 cm in segments 7 and 8	Right hepatectomy
28/female	6 cm in segment 5	Non anatomical

though several authors used fine needle aspiration as well as core biopsy without any bleeding complications.³ If the suspected hemangioma turns out to be malignant, then there is the added fear of disseminating the malignant cells along the track of the biopsy needle. In our patients, the specificity and sensitivity of ultrasound and CT scans were 100%. In general, it seems that resection for a liver hemangioma is safe, however, controversy remains as to the precise indications of surgical resection, particularly when faced with a giant asymptomatic hemangioma.

The natural history of liver hemangioma is poorly understood and, therefore, controversy regarding the choice between resection and conservative treatment remains unresolved. In a large series of patients from Italy, out of 78 lesions, 16 were resected and 62 were followed up with six-monthly ultrasound for up to 55 months, and none of the lesions ruptured or became symptomatic.⁴ In a Japanese series of 20 patients with small hemangioma, follow-up for up to eight years failed to indicate symptoms or significant increase in size.⁵ In a study from Germany, out of 238 patients with hemangioma, 143 patients had resection and the rest were followed up for a median period

of 32 months. There was no increase in the size in 80% of the cases, and no single case ruptured.⁶ An English literature review in 1991 showed that there was no single incidence of rupture in 282 patients at one-year follow-up, however, when rupture occurred, the mortality was high, reaching 78% in 37 reported patients.⁷

Surgical resection should be safe, since the rest of the liver is normal and liver failure is, therefore, rare. This is in contrast to the common problem of liver decompensation when resection is done in cirrhotic patients. Mortality rate in most of the large liver centers is less than 1%,² while a literature review in 1991 showed a mortality of 1.5% and a morbidity of 13%.⁶ Although major resection of a giant hemangioma does not lead to liver failure and is safe in most cases, bleeding during the surgical resection can be severe, requiring massive blood transfusion.⁷ In our patients, there was no mortality, and blood transfusion did not exceed 2 units, except in one patient who had a formal right lobe resection. The patient bled massively from avulsion of a posterior right hepatic vein, which was eventually controlled. The morbidity in our patients was minimal and was related mainly to pulmonary complications.

It seems that the best approach for asymptomatic giant hemangioma is regular follow-up, and that the rate of increase in the size of a hemangioma is more important than the original size to start with in terms of the chances of complications.⁴ It is also vital not to attribute symptoms of other pathologies to the incidental finding of a hemangioma, when investigations are being done for that particular pathology. Obviously, resecting the hemangioma will not relieve these symptoms, thereby exposing the patient to an unnecessary major surgical procedure. Figure 1 illustrates a management algorithm of a hemangioma.

In our patients, formal resection was performed when the hemangioma occupied a large area of a lobe. Simple inoculation was done safely in one patient. Simple enucleating has been reported to be safe without major blood loss.^{4,9}

Surgical resection is the treatment of choice for a giant symptomatic hemangioma, and if it is unresectable, then liver transplantation may be considered.¹⁰ Our experience indicates that resection of giant hemangioma of the liver is safe. The indication for resection, however, should be carefully analyzed before embarking on such a major operation. This should be done in a specialized hepatobiliary unit, where experience with liver resection is available.

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