

Management of Giant Hepatic Hemangiomas-Case Series and review of literature

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Abstract

Giant Hemangiomas (GH) are benign liver tumours which are more than 4 cm and can be frequently symptomatic. They may be associated with complications due to local compression, rupture or rare coagulopathy syndromes like Kasabach-Merritt Syndrome (KMS), which are all indications for surgery. Surgery can be either enucleation or hepatic resection where enucleation is the usual surgery of choice and hepatic resection, reserved for indications like complete lobe involvement by the tumour

METHODOLOGY

All cases of operated giant hepatic hemangiomas were retrospectively analysed and statistical analysis done using unpaired t test for test of significance. $p < .05$ was statistically significant.

From 2007-2017, 17 cases of giant hemangiomas (M:F::1:16) were operated. The mean age of the patients was 41.6 years (22-60 years). The main symptoms included abdominal pain (N=16, 94.1%), and abdominal mass or fullness (N=14, 82.3%). Surgical removal of hepatic hemangiomas was performed due to intractable symptoms (12 cases), increase in size (1 case), liver failure (1 case) and uncertain diagnosis (3 cases). In all, 3 patients underwent enucleation of hemangiomas, while the remaining 14 underwent anatomical resection. The surgeries included right hepatectomy in 7, left hepatectomy in 3 and left lateral segmentectomy in 4 cases. One patient underwent preoperative angioembolisation as the tumour was very large (5.2 kg on post op measurement) and then followed by sorafenib. Unfortunately, patient did not tolerate sorafenib treatment and hence had to be taken for surgery expeditiously. One patient had features of KMS (Kasabach Merrit Syndrome) and had to be managed for the same.

Pringle maneuver was done in 2 cases. Parenchymal transection was done using a combination of Kellyclisis and diathermy in most cases. The mean blood loss and operative time for patients undergoing enucleation was 500 ml (range, 500-600 ml) and 146 min (range, 140-150 min) which was statistically less than that for patients undergoing anatomical resection at 746 ml (300-2000ml) and 193.5 min (140-420 min). ($p < .05$). The mean hospital stay was also less for those undergoing enucleation (10.3 days, range 10-11 days) than anatomical resection (12.7 days, range 7-18 days) ($p < 0.05$)

We observed one perioperative mortality in patient with liver steatosis who had post operative liver failure and two cases of major morbidity (bile leaks not requiring reoperation). All other patients were completely cured of their symptoms and remain alive and in good health, without long term complications, after a follow-up period ranging from 1 month to 10 years

Key Words: Hemangioma, hepatectomy, Kasabach-Merritt, enucleation

Date of Submission: 30-12-2018

Date of acceptance: 15-01-2019

I. Introduction

Hepatic Hemangiomas are seen with prevalence ranging from 3% to 20% on various autopsy series [1, 2] and the estimated incidence in population range from 0.6 to 7% which is predominantly among females (3:1) in the fourth and fifth decade. [1,2]

The majority of hepatic hemangiomas are asymptomatic and diagnosed incidentally. Giant hemangiomas (GH) are defined as tumors larger than 4 cm. This is taken as the limit as symptoms rarely appear unless the tumor exceeds this size. [3,4] However, it is thought the definition of giant hemangioma should be increased to a minimum size of 10 cm as lesions below this size limit are generally less likely to be symptomatic and those (< 5 cm) are less characteristic on imaging. Patients with a giant hemangioma (GH) may have inflammatory features and a triad of elevated erythrocyte sedimentation rate (ESR), thrombocytosis and reversible hyperfibrinogenemia. [5,6] About 40% of GH exhibit growth with rates of about 2 mm/year [7] and some larger tumours which exceed this growth rate may be related to intralesional bleeding

The symptomatic patient should be evaluated to rule out additional unrelated intra-abdominal pathology which may be seen in 42% of symptomatic hepatic hemangiomas .[5] In another study , 50 % of GH patients remained symptomatic after surgery which may be due to other non specific causes . [6] Symptoms commonly seen in GH per se include abdominal fullness or pain (due to haemorrhage within the hemangioma or into abdominal cavity), jaundice ,Gastric Outlet Obstruction (GOO), hepatic lobar atrophy due to local compression and cardiac failure from massive arterial-venous shunt. [9,10]

Conventional grey-scale ultrasound is the most common first line investigation and CECT scan confirms the diagnosis in most patients. In case of equivocal CT, MR scan , with a high sensitivity (98- 100%) and specificity (92-98%) can be used to diagnose hepatic GH as characteristic hyperintense lesion in T2 phase with high accuracy .[13] However, large GH may appear heterogenous further causing confusion in diagnosis.[14] It is reported that the diagnostic accuracy using a combination of MR scan and Tc99m-labelled red blood cell scan , increases the diagnostic accuracy further to 90–95%.[15] Conventional angiography show typical “cotton wool” or “snowy tree” appearance after contrast injection . Still, a proportion of cases are inconclusive which may necessitate surgery .It is now agreed that liver FNAC can be done due to low incidence of complications and are done when radiology and alpha fetoprotein testing are equivocal.[16]

Conservative management and serial surveillance is preferred for the vast majority of patients as the complication rates of observation are similar when compared to operative management .[17] Therefore , operative treatment of liver hemangioma is indicated in symptomatic cases , increase in size ,complications due to giant hemangiomas like rupture , KMS and uncertain diagnosis .In most studies , the most common indication for surgery is the presence of symptoms . [18,19] Because the possibility of malignant transformation is so rare, it is unlikely to be a cause for surgery [20]

Described in 1940 [2], Kasabach-Merritt syndrome (KMS) is thrombocytopenic purpura characterised by profound thrombocytopenia , consumptive coagulopathy and intravascular haemolysis suggestive of disseminated intravascular coagulation (DIC).It is thought to be due to platelet activation when in contact with the abnormal endothelium of the hemangioma leading to shearing stress and coagulopathy . This is reversed by resection of the tumour. In a study of 97 cases of symptomatic GH , 52.6% had non spontaneous rupture and was more frequent in patients less than 40 years with a mean size of 11.2 cm (range 1-37 cm). Though massive bleeding occurred in 90.7%, overall mortality has come down to 35%.[21] Immediate surgery is mandatory in unstable patients with a ruptured giant hemangioma which can be treated with surgical enucleation and ancillary procedures like intermittent inflow vascular occlusion and temporary perihepatic packing.[22]

Microscopically , HA consist of mostly dilated disorganized blood vessels , separated by fibrous connective tissue with a variable fibrous tissue. 80% of hepatic HA are of the cavernous type which are larger than the less common capillary type and are therefore more symptomatic.[23]

Radiological procedures like Transcatheter Arterial Embolization (TAE) are increasingly used in the treatment , either as a preoperative temporising measure before parenchyma preserving surgery instead of massive resection or rarely as definite treatment . [24] Embolization should be selective [25] and the vascular interstices within the hemangioma and the feeding arterioles are obliterated with gel-foam , polyvinyl alcohol particles or steel coils in some cases [26]. The most common complications of embolization are self limiting and include pain, pyrexia, leukocytosis ,and nausea. Postembolization pain though described frequently , is rare.[25] TAE should be used in GH when the hepatic hemangioma increases in size, or is symptomatic or features like Kasabach-Merritt syndrome, compression occur with concomitant high surgical risk. [27]

The most preferred option for symptomatic giant hepatic hemangiomas is surgery . Several studies reported high morbidity of 10 -27 % and mortality of 2% after resection or enucleation of hepatic hemangiomas . [27,28] Enucleation is safer, quicker and is associated with less recurrence than liver resection where recurrence is thought to be due to increased release of growth factors contributed by the stimulus of initial resection . [30] Resection is still ideal for patients with uncertain diagnosis or total replacement of a lobe .Though enucleation and hepatic resection can be performed irrespective of tumour size , enucleation generally has shorter mean operative time, significantly shorter duration of hospital stay ,decreased blood loss and bile leak as the plane of enucleation is a blood vessel -bile duct free interface between the liver and tumour .[31]

Enucleation can also be applied successfully to large or centrally located hemangiomas with Pringle manoeuvre at appropriate intervals.[32] In a study of complications after surgery for GH, most complications were grade I, with both techniques being relatively safe .Both had acceptable complication and mortality rates which are related to the proximity to major vascular structures than size . [33,34] In a long term study of 33 enucleation patients , surgery was successful in complete symptom control in 88 % [9]

Laparoscopic resection is feasible in GH especially in pedunculated GH in the inferior segments of the right lobe of the liver.[35] An array of thermal transection devices can be used as in our case series.Liver transplantation from both deceased and living donors is treatment of last resort for a very limited group especially unresectable lesions, multiple bilobar and hepatic hilum involvement. [36,37]

Non operative pharmacological treatment has also been considered to shrink the tumour before surgery but their role is controversial. Propranolol, an oral non-selective beta blocker is effective for proliferative infantile hemangiomas. [39] This may be due to multiple mechanisms like vasoconstriction, induction of apoptosis, down regulation of angiogenic factors such as vascular endothelial growth factor (VEGF) and basic fibroblast growth matrix metalloproteinase 9 inhibitor (MMP9). [38,39] Very large GH can be treated by sorafenib for tumour shrinkage. Significant tumour shrinkage may occur, as seen in one of our cases also. However, this tumour shrinkage must be balanced with issues of non compliance and debilitating adverse effects which may require treatment cessation. [40] It is still not clear whether the tumor shrinkage is due to the VEGF inhibiting effect of sorafenib.

Conclusion

Surgical approaches are the best for the management of symptomatic giant hemangiomas where the exact choice of surgery is further influenced by tumour involvement of liver and certainty of diagnosis. Non symptomatic hemangiomas are best followed by surveillance. Liver transplant may be a last resort for a certain subset of patients. Non pharmacological approaches have so far been unpromising in the long term management of giant hemangiomas.

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Amarjothi J M V. “Management of Giant Hepatic Hemangiomas-Our Experience.” *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 1, 2019, pp 23-26.