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ORIGINAL ARTICLE

Surgical Management of Hepatic Haemangioma: A Centre Experience.

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ABSTRACT

Background: liver haemangioma considered as the commonest benign lesion. Diagnosis mainly done incidentally during abdominal ultrasound (US). Giant haemangioma describe mass more than 5cm. But some authors considered giant more than 10cm. Most of the haemangiomas are asymptomatic which requires only follow up. Surgery is an option when patient start to complain or for fear of its rupture. Two methods used for surgical management either enucleation or liver resection.
Methods: Between 2014 and 2018 we managed twenty-two patients diagnosed as giant haemangioma, study design was a retrospective held in Hepato-Biliary centre, General Surgery Department, Zagazig, Egypt.
Results: Nine patients manged via surgical resection, while in the other thirteen patient's enucleation was the chosen procedures. We found no mortality and during follow up no de-novo lesions appeared.
Conclusion: surgical intervention for symptomatic giant haemangioma is the optimal chosen management procedure. There is no specific size to choose surgery for haemangioma management, but giant haemangioma is prone to complicate, so prophylactic surgery sometimes is an option. Morbidity and mortality incidence decreased after liver surgery improvement.
Keywords: Haemangioma, Enucleation, Liver Resection

INTRODUCTION

Haemangioma diagnosed first in autopsy as the commonest benign liver lesion with an incidence of 0.4–7.3 % in autopsy series [1]. In the general population it could be present in (3% to 20%) [2]. Regarding gender, its incidence is common in young adult females [3]. Still its pathogenesis is a mystery, but being more in female patient's hormonal level change occurred during pregnancy and using oral contraceptive pills, may explain the cause of its development [4,5,6].

Diagnosis of haemangioma usually occurred during routine abdominal US. To confirm, abdominal computed tomography (CT) used with a special criterion as enhancement will be in the periphery and also in the lesion centre. But when in doubt, magnetic resonance imaging (MRI) used to precisely clarify the anatomical relationship of Glissonian pedicle and haemangioma [7].

Usually, haemangiomas less than 4cm discovered accidentally and manged managed observative [8,9,10]. Indications for surgy was; severe symptomatic giant haemangioma (compression symptoms), unsure diagnosis, patient anxiety, Kasabach-Merritt syndrome, consumptive coagulopathy, rupture or progressive enlargement [7,8,11,12,13]. Non conservative modalities vary; segmentectomy, enucleation, hepatic artery ligation, liver transplantation, transcatheter arterial embolization (TAE) or radiofrequency ablation (RFA) considered possible ways of management [14,15,16,17].

Bleeding is the nightmare complication post liver resection which may result in operative mortality. With specialized centres, bleeding became uncommon event, but bile leak could be an annoying comorbidity accompanying surgery. So, enucleation carry the safest surgical procedure more than liver resection for haemangioma treatment (especially in centres with limited experience in liver resection) [18,19,20].

METHODS

Written informed consent was obtained from all participants, the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Between 2014 and 2018 we managed twenty-two patients diagnosed as giant haemangioma, study design was a retrospective held in Hepato-

Biliary Centre, General Surgery Department, Egypt. The most common indication for surgery was abdominal pain.

Pre-operative sheets included; personal information (gender, age, occupation and residency). Also lesion data regarding how many, its diameter and where is the lesion. Laboratory data; liver function, kidney function, CBC and bleeding profile. Radiological investigations usually were abdominal US, abdominal CT and MRI when diagnosis was doubtful.

Operatively we calculate; operation time, bleeding amount, blood transfusion, plasma transfusion and duration of admission.

We followed up our patient for 6-12 months, in the first month patient visit us once a week, then patient visit us once a month. We check them by routine abdominal US and liver function tests. We estimated the ability of the liver to regenerate and if there was a new lesion or not by CT or MRI after six months and one year (Figures 1).

Surgical Steps:

Routine anti-coagulant regimen applied. To decrease pain after surgery, we used thoracic epidural catheter. J shaped incision used, but sometimes we need to extend the incision to rooftop with mid-line extension. Complete liver mobilization. Pringle's manoeuvre was a standard step (we followed the protocol to inflow control for fifteen minutes and then five minutes release, with no limits to use it). Parenchymal dissection via either clamp fracture (Kelley forceps) or harmonic scalpel. Enucleation or resection done according to the lesion site. Tube drain was inserted to assess blood or bile leak after surgery.

Statistical Analysis:

It was performed using SPSS 22.0 statistical software package. Continuous data were expressed as the mean ± standard deviation (SD), and t-test was used to compare the continuous variables. The difference was statistically significant at $P < 0.05$.

RESULTS

Female gender was with highest incidence in 16 cases. Frequent presentation was upper abdomen discomfort in 13 patients. Preoperative data details shown in **Table 1**

Indications for operation in our patient was; upper abdominal discomfort in in seven cases. Rapid enlargemet (detected by follow up CT) in five 5 cases. Abdominal mass in four patients (prophylactic resection). Kasbach-Merritt syndrome in two patients. And gastro-intestinal upsets in five cases.

In liver resection group we did; left lateral segmentectomy in four cases, formal left resection in two cases, segmentectomy of segment 6&7 in another two cases and only formal right resection in one case. While most of enucleation cases were found in right lobe (7 patients).

Regarding types of surgery, we found no statistically significant relationship regarding blood loss and blood transfusion. Operative time, inflow control, ICU stay, whole hospital stays and postoperative complications were also similar for both groups as showed in **Table 3**. Complications of our patients showed in **Table 3**, all of them managed conservative except one case of incisional hernia that needed mesh repair after 6 months from operation. The most common complication was pleural effusion.

Table 1: Preoperative Patient Data Hemangioma.

Demographic data:	Enucleation	Resection
Patients Nu:	13	9
Age: (mean ±SD)	**40.352±9.207**	**39.588±7.811**
Sex:		
Male	**3**	**3**
Female	**10**	**6**
Symptoms:		
Abdominal Pain.	**9**	**4**
Abdominal Mass.	**4**	**5**
Upper Abdominal Discomfort.	**2**	**2**
Biliary Colic.	**1**	**2**
Kasbach Merritt Syndrome.	**1**	**1**
Past Medical History:		
Non	**10**	**7**
Hypertension	**2**	**1**
DM	**1**	**--**
DM + Hypertension	**--**	**1**
Preoperative Data:		
HB %	**10.115±1.26**	**10±1.391**
Platelet	**199.23±70.292**	**183.333±71.589**
AST	**26.538±7.434**	**23.888±6.233**
ALT	**21.538±6.765**	**18.222±5.607**
Bilirubin	**1.023±0.173**	**1.055±0.101**
INR	**1.1±0.182**	**1.1222±0.139**

Table 2: showed lesions data regarding its number, site, size and location.

Haemangioma characters	Enucleation (13)	Resection (9)
Lesions Nu: • 1 • 2	**14 lesions** **12** **1**	**10 lesions** **8** **1**
Size: (mean ±SD) • 5-10cm. • 10-20cm. • > 20cm.	**18.612±3.854** **2** **10** **2**	**14.549±4.957** **3** **5** **2**
Site: • Bilateral. • Left Lobe. • Right Lobe.	 **4** **2** **7**	 **2** **4** **3**
Location: • Peripheral. • Central.	 **9** 4	 **5** 4

Table 3: Lesion Data (Number, Site, Size and Location).

	Total patients 22	Resection 9 patients Left Lateral (4) Left Formal (2) Right Post. (2) Right Formal (1)	Enucleation 13	P-value
Association: ▪ Cholecystectomy. ▪ Splenectomy.	 3 2	 2 1	 1 1	
Operative time:	**176.36±66.08 min**	**198.888±85.651 min**	**160.796±45.909 min**	**0.190**
Blood loss:	**811.36±499.03 ml**	**916.666±523.211 ml**	**738.461±489.112 ml**	**0.424**
Blood Unit Transfusion:	**2.72±1.6**	**2.888±1.45**	**2.615±1.75**	**0.705**
Fresh Frozen plasma Transfusion:	**3.65±1.98**	**3.451±1.65**	**3.651±1.89**	**0.625**
Hospital Stay:	**7.36±2.17 days**	**7.444±2.18 days**	**7.307±2.25 days**	**0.889**
ICU stay:	**(15) 0.954±0.785**	**(7) 1.11±0.78**	**(8) 0.846±0.8**	**0.450**
Inflow control: ▪ **Yes.** ▪ No.	 **17** **5**	 **6** **3**	 **11** **2**	**0.001***
Complications: ▪ **Bile Leak.** ▪ Pleural Effusion. ▪ Ascites. ▪ Paralytic Ileus, ▪ Wound Infection. ▪ Incisional Hernia. ▪ Chest Infection.	**12** **1** **5** **2** **2** **3** **1** **2**	**5** **-** **1** **1** **1** **2** **1** **-**	**7** **-** **4** **1** **1** **1** **-** **2**	**0.227**

DISCUSSION

Haemangioma considered the most common benign lesion of the liver. Conservative management take the upper hand during dealing with haemangioma. Miura et al, stated that operative management still a debatable issue. Usually, liver haemangioma takes a long benign pathway, therefore follow up of non-symptomizing cases is the gold standard method in management [21,22,23].

Prophylactic resection is not an option for managing asymptomatic lesions, despite of its enlargement or patient anxiety. The cause of this opinion is the fact that life threatening complications occurrence is rare following haemangioma [23].

Surgical management carries the benefit of resolution of pre-operative symptoms [23]. This is matching with our results, and also match a cross published series, emphasized that 70% to 100% of symptomatic patients respond to surgical management [13,24,25].

Severe abdominal pain, is the most common cause of surgical interference. But in our study, we also managed haemangioma associated with syndromes (Kasabach–Merritt Syndrome), only in two patients. Yamagata et al [26] & Miura et al [23] faced only one patient.

Those surgeons who decided to do prophylactic surgery of non-symptomatic haemangiomas; depend on that haemangiomas more than 10 cm, have the possibility of bleeding, more enlargement or even rupture [16,27,28]. We had four huge peripheral haemangiomas, underwent prophylactic resection for fear of its rupture.

Regarding choosing the best surgical option, some authors recommend liver resection [13,29] while others recommend enucleation [27,30]. Others compare both of the procedures, and emphasized that lesion enucleation has the advantages of less operation duration, complications, admission time and also operative blood loss [31,32]. In our study, we did enucleation surgery in 13 patients, with no difference between liver resection and enucleation regarding blood loss; morbidity; vascular inflow occlusion time and frequency; operative time and hospital stay.

Giant haemangioma resection absolutely has a high risk of bleeding. Ulas et al [33], reported blood loss more than one litre in 10 (19.2%) patients; according to this study the cause of bleeding due to hepatic vein injury and central location of the lesion. In our series, we had blood loss more than one litre in 7 (31.8%) patients. We also agreed with Xiao-Hui F et, al. [28] who stated that surgical central haemangiomas management carries the risk of bleeding intraoperative more than peripheral haemangiomas.

CONCLUSIONS

Surgery must be a very wise decision regarding haemangioma management, as only follow up is a very effective way in managing asymptomatic patients. There are two procedures to manage giant and complicated haemangiomas; lesion enucleation and liver resection. Despite we found no difference in both procedures, but we recommend enucleation being the safest. Using haemostatic protocols, decreased blood loss during surgery. Experienced hepato-biliary surgeons in highly specialized centres improve results of haemangioma management.

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