

# Therapeutic options of giant liver hemangioma

## Abstract

Liver hemangiomas are commonly the most frequent benign lesion of the liver. They are generally smaller, asymptomatic and diagnosed incidentally in imaging studies. A liver hemangioma is qualified giant when it has a size larger than 5cm. Asymptomatic and non-complicated giant liver are managed conservatively by observation. However, lesion with incapacitating symptoms or complications is managed surgically. Surgery remains the most effective and radical therapeutic modality to treat liver hemangioma. Thus both enucleation and liver resection can be performed to remove the lesion. However recent studies demonstrated that enucleation was a safer, Quaker surgical procedure and associated with lower complication and less blood loss. Non-surgical treatment options have been described to be used alone or in combination with surgery. This mini-review provides a general view of the therapeutic options employed to treat giant liver hemangioma.

**Keywords:** giant liver hemangioma, observation, surgery, resection, enucleation

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## Introduction

Liver hemangiomas are often asymptomatic, smaller and diagnosed incidentally. A giant hemangioma is defined as a lesion with a diameter greater than 5cm. Giant hemangiomas can become symptomatic and may cause mechanical complications related to tumour size.<sup>1</sup> Also, complications such as coagulation disorders, bleeding and traumatic rupture can occur during conservative management period.<sup>1</sup> Asymptomatic and non-complicated giant hemangiomas can be safely observed with lower adverse events and the hemangioma size alone is not supported for indication of surgery even for very large lesion.<sup>2-4</sup> Severe incapacitating symptomatology or complications occurred during observation are justifiable of surgical management.<sup>2-6</sup> Surgery is the most effective therapeutic modality to treat liver hemangioma.<sup>4,6</sup> A hemangioma can be removed by enucleation or liver resection however, most authors advocated enucleation procedure. In very rare and exceptional condition, Liver transplantation can be considered as a treatment option for hemangioma.<sup>7-10</sup> Other therapeutic options as Radiofrequency ablation (RFA) and transcatheter arterial embolization (TAE) can be considered in some situations. This mini-review provides a general view of the therapeutic options employed to treat giant liver hemangioma.

## Observational approach

The management of giant liver hemangioma (GLH) varies from observation to a variety of non-surgical and surgical procedures. The published studies assessing observation of giant liver hemangiomas demonstrated that health status and quality of life of observed patients varied from good to excellent concluding that observation was safe in most patients.<sup>11</sup> Conservative approach is justified even in very large hemangiomas and tumour size alone is not supported as an indication for surgery.<sup>12-17</sup> Thus, asymptomatic and non-complicated giant liver hemangioma can be safely observed by supervision through regular imaging control with lower risk of adverse events.<sup>2,15-21</sup>

## Non-surgical therapies

Non-surgical options have been described and proposed as therapeutic methods of giant liver hemangiomas including

transarterial embolization (TAE) and radiofrequency ablation (RFA). A possible reduction of symptoms has been noted after TAE, however, there was no change in tumour size and recurrence was common.<sup>22</sup> In complicated hemangioma, transarterial embolization is used before surgery to stabilize ruptured lesion. In an extremely large lesion, Preoperative TAE is widely performed to decrease blood supply and to reduce tumour size making thus definitive surgery easier and less risked.<sup>22-27</sup> Radiofrequency ablation was successful to control symptomatic smaller lesions (5-10cm diameter).<sup>28</sup> However, RFA is associated with high rate of complications in lesion greater than 10cm and its use is inappropriate in very large hemangioma (>10cm).<sup>28</sup>

## Surgical approach

The indications of surgery for giant liver hemangioma is well defined and symptomatic or complicated lesions are the most conditions requiring surgical management.<sup>4,13,18,29-31</sup> Combined use of advanced various imaging techniques allows to establish diagnostic certainty in most cases. Nowadays uncertainty of diagnosis is become a rare criterion for surgical treatment.<sup>20,32</sup> Furthermore surgery remains the effective therapeutic method to treat liver hemangioma. Surgery includes liver resection, enucleation and transplantation.<sup>29</sup> A rare cases of liver transplantation performed for diffuse hepatic hemangiomatosis, lesions anatomically unresectable by conventional approaches and in patients with Kasabach-Merritt syndrome, have been reported.<sup>7-10</sup> However there is a shortage of liver graft and the need of a long-term anti-immunologic treatment in transplanted patients. When surgery is indicated, hemangioma can be removed by both liver resection and enucleation procedures. The choice between liver resection and enucleation depends mainly on location, number and size tumor, complications, preference and technical skills of surgeon.<sup>33,34</sup> Enucleation is more preferred in peripheral and right-sided located hemangioma. Also it is more suitable in case of multiple locations leading to preserve normal liver parenchyma.<sup>12,33,34</sup> Liver anatomic resection is more preferred in centrally located lesion or when lesion is near or compresses large vessels with high risk of bleeding and prolonged operative time.<sup>35-37</sup> However the risk of blood loss and transfusion is more related to hemangioma size and very large lesion (>20cm) is associated with high risk of operative bleeding.

In such condition, liver anatomic resection is the more suitable procedure.<sup>33,34</sup> Complications such as bleeding and rupture occurred during observation constitute an emergency situation, and in such condition liver resection is more preferable to avoid aggravation of a serious situation and to minimize the risk of operative complications.<sup>37</sup> According to advances made in liver surgery, enucleation meets the requirement of precise liver surgery which is precision, minimal invasiveness, and effectiveness.<sup>21</sup> Results of recent meta-analyses comparing outcomes of enucleation versus those of anatomic resection for giant liver hemangioma revealed no surgery-related death in both enucleation and resection, however, enucleation was associated with significantly lower blood loss, lower operative time, and lower risk of complications.<sup>38,39</sup> Most authors advocated enucleation because it is safer and quicker with lower overall complications and less blood loss.<sup>18,29,33,40–42</sup> An increase in mini-invasive surgical procedures for liver benign tumors including hemangiomas has been reported in the last two decades.<sup>6</sup> This progress is technically explained by the no need to radical margin and liver normal parenchyma is more easily manageable.<sup>6</sup> The indications for the laparoscopic approach are the same as those of open surgery. Mini-invasive resection of anterior location hemangioma can be performed easily. However the impact of a minimal approach in reducing operative risk or complications is not clearly defined.<sup>43–46</sup>

## Conclusion

In summary, as demonstrated and admitted by authors, asymptomatic or con complicated giant liver hemangiomas can be safely observed with the very lower risk of complications. When surgery is indicated, giant liver hemangiomas can be safely removed by either enucleation or liver anatomic resection. Compared to resection, enucleation is associated with lower morbidity and less blood loss. Hence, this surgical procedure is advocated by most surgeons to treat liver hemangioma. Transarterial embolization (TAE) and radiofrequency ablation are to be considered before surgery in an extremely large lesion to reduce the risk of bleeding and complications.

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## Conflict of interest

The authors have no conflict of interest to report.

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