A giant cavernous hemangioma of the liver extending into the pelvis

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\textbf{A B S T R A C T}

\textbf{INTRODUCTION:} Giant cavernous hemangiomas are the most common tumors of the liver, occurring in up to 20% of the general population. Given their benign course, asymptomatic nature and slow growth rate, treatment is rarely indicated. The case presented herein is unique as it describes an uncommon presentation of this common tumor and the circumstances in which surgical treatment is beneficial.

\textbf{PRESENTATION OF CASE:} We present a case of a 66-year-old patient with prostate cancer referred for evaluation of a massive 37 cm giant liver hemangioma, extending into the pelvis and in the planned field of radiation for prostate cancer, exhibiting rapid growth, and associated with significant symptomatology. Given these clinical characteristics, the patient was offered surgery and underwent a left trisectionectomy with an uneventful recovery. The patient's symptoms resolved and he was able to complete radiation to the pelvis.

\textbf{DISCUSSION:} In the context of an unusual presentation, this case presentation reviews the typical clinical and imaging characteristics of giant liver hemangiomas and expands on the current indications for treatment, emphasizing the role of enucleation and resection for patients meeting appropriate indications.

\textbf{CONCLUSION:} Although liver hemangiomas are extremely common, surgical treatment is rarely required. With appropriate indications, and when enucleation is not feasible or ideal, major liver resection is a safe alternative approach with excellent outcomes when performed in the right setting.

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With the diagnosis of giant hemangioma (GH) established the goal of treatment was to remove the mass while preserving the majority of uninvolved liver. Preoperative imaging was not able to discern if clear planes of dissection would be present at the level of the hilum, although a completely replaced right hepatic artery was present. On exploration, despite the massive size of the GH, it was found to be pedunculated and free from the hilar structures allowing for safe dissection (Fig. 3). Early inflow control was obtained by transecting the proper hepatic artery (after confirming the replaced right hepatic artery was adequate), accomplishing downsizing of the tumor to 30 cm. Given the mass was encompassing the middle and left hepatic veins, and transection of these structures would be necessary for safe and complete resection, we opted for performing an anatomic resection rather than enucleation of the GH. The trunk of the middle and left hepatic veins was isolated and transected, in the form of an anatomic left trisectionectomy, although a significant portion of uninvolved right liver parenchyma was preserved (Fig. 4). The patient recovered well and was discharged 4 days after surgery. He is now 9 months from resection and has completed radiation therapy. The preoperative symptoms of pain/discomfort and early satiety have fully resolved, with normalization of total bilirubin levels. Recent follow-up CT scan performed for prostate cancer surveillance revealed adequate hypertrophy of the liver and no evidence of residual or recurrent hemangioma (Fig. 5).

3. Discussion

We present a case of a patient with a massive giant hemangioma (GH) of the liver requiring surgical intervention. This case is particularly interesting as it highlights a number of uncommon circumstances not typically seen in patients with liver hemangiomas. First, the clinical presentation was not characteristic of a GH given its massive size with unusual extension into the pelvis, its rapid growth and the associated symptomatology. Further, despite typical progressive peripheral nodular enhancement on cross-sectional imaging, the common finding of delayed centripetal “fill-in” was absent [3], due to the presence of major cystic components. With these unusual clinical and imaging characteristics,
the differential diagnosis was broader and included concern for an underlying neoplasia (i.e., hepatocellular carcinoma or cystadenoma/cystadenocarcinoma). Additional clinical, imaging and laboratory information were used to narrow the diagnosis so that appropriate treatment could be established; in the context of no underlying liver disease, with the pattern of peripheral nodular and progressive enhancement of a solitary lesion, normal tumor markers and lack of any distant disease, the preoperative diagnosis of a giant CLH was confirmed—with the cystic components representing large cavities with old blood/thrombus from the cavernous process and intermittent intralesional bleeding, further ruling out other more malignant processes.

The vast majority of CLH including giant hemangiomas (GH) have a benign course and require no treatment. When surgery is performed, the most common indication in adults is pain, followed by other less common reasons including uncertainty of diagnosis, complications such as rupture/bleeding or Kasabach–Merrit syndrome, and rapid growth [4]. Following hemangioma resection, pain usually subsides in approximately 63–75% of patients [2,4], emphasizing the importance of completing a comprehensive work-up for other causes of pain before considering surgical treatment. This case was also unique given the rapid growth rate observed. A recent study examining the course of liver hemangiomas found that only ~40% of CLH exhibit growth overtime, and for this select group, growth rates are in the order of 2 mm/year [5]. Our case had significant growth during a 1 year timespan, exceeding the reported growth rates, and stressing the previously reported association between larger GH and faster growth rates [5]. Although the faster growth rate observed in such cases is still poorly understood, it may be related to intralesional bleeding, as the cystic component with blood/thrombus represented the primary contributor of growth in our patient.

Treatment options for GH include arterial embolization and surgery for enucleation, resection or transplantation (rarely) [1,2,4]. A number of studies comparing the outcomes of resection and enucleation have found enucleation to be associated with lower risk of postoperative complications (primarily bile leak), and is currently the preferred approach [6]. Resection remains an appropriate alternative for cases in which the extent of the hemangioma is such that transection of major vascular structures is required and enucleation across these areas, although feasible is less safe and not ideal (as occurred in this case). In this setting, major liver resections including “super-extended resections” have been reported to be safe and associated with excellent outcomes when performed in high-volume centers [4,7].

4. Conclusion

Cavernous liver hemangiomas are the most common liver tumor, often presenting as giant hemangiomas (>5 cm). These tumors are typically asymptomatic and exhibit very slow growth rates. Treatment is rarely indicated. The case presented herein represents an ideal example of an uncommon presentation of this common tumor and the circumstances in which surgery is required. Almost invariably, surgery is only indicated for very large giant hemangiomas presenting with associated symptoms (most commonly abdominal pain), rapid growth, and/or when the diagnosis is uncertain (rarely). When the appropriate indications are present, enucleation is the preferred surgical approach. When enucleation is not ideal, major liver resection is a reasonable and safe alternative, with excellent outcomes when performed in the appropriate setting.

Conflict of interest

No conflicts of interest to report.

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Ethical approval

As this is a case-report of one individual (who has provided informed consent), an ethical approval was not required.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

Daniel Anaya conceived the initial idea of the study. Daniel Anaya and Jiayi Kong acquired data for publication, drafted manuscript and revised it critically for important intellectual content. All authors approved the final version of the manuscript submitted.

Research registry

This is a case-study – researchregistry300.

Guarantor

Dr. Daniel Anaya.
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