

ORIGINAL ARTICLE

Long-term outcomes of resection in patients with symptomatic benign liver tumours

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Abstract

Background: Benign liver tumours (e.g., hepatocellular adenoma (HCA), focal nodular hyperplasia (FNH), and haemangioma) are occasionally resected for alleged symptoms, although data on long-term outcomes is lacking. The aim of this cross-sectional study was to assess long-term outcomes of surgical intervention.

Methods: Forty patients with benign tumours (HCA 20, FNH 12, giant haemangioma 4, cysts 4) were included. Patients filled in Validated McGill Pain Questionnaires, preoperatively and after a median of 54 months after resection. Outcomes were evaluated using paired sample t-test and (M) ANOVA.

Results: Relief of symptoms sustained in 30/40 patients, within a follow-up of 54 (24–148) months after resection. VAS scores were reduced from 5.5 preoperatively to 1.6 postoperatively ($p < 0.001$). Patients with left-sided tumours had higher postoperative Pain Rating Index (PRI), compared to patients with right-sided tumours: 15.3 vs. 5.8 ($p = 0.018$). If patients could reconsider undergoing surgery, 34/38 would again choose resection. Discomfort at the operative scar was the most common complaint: 8/40 patients, all after open surgery, of whom 3/40 had an incisional hernia. 7/40 patients had a laparoscopic resection.

Conclusion: Resection relieved symptoms in 30/40 patients. The operative scar was a frequent source for remaining postoperative complaints, suggesting an advantage for a laparoscopic approach when feasible.

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Introduction

Benign liver tumours such as hepatocellular adenoma (HCA), focal nodular hyperplasia (FNH) and haemangioma may give rise to abdominal complaints, depending on size and location in the liver.¹ Surgery may be indicated solely on the presence of symptoms, although it is sometimes difficult to define the causal relationship with the detected liver lesion. Hepatocellular adenomas most frequently occur in females at the age of 20–40

years, and are associated with longstanding usage of oral contraceptives.^{2–5} This is reflected in the annual incidence of 30–40 HCA per million in women with a history of oral contraceptive usage, versus 1 per million in women who never have used oral contraceptives.⁵ Haemangiomas also occur most frequently in females, with a female/male ratio of 3:1.^{6–8} They consist of cavernous vascular spaces and are the most prevalent benign liver tumours. Focal nodular hyperplasia is the second most prevalent benign liver tumour. Because the tumour consists of the same

cellular material as normal liver parenchyma, FNH can be difficult to diagnose using standard T1 weighted MRI images. A “central scar” on T2 weighted images, is however pathognomonic for FNH.^{9,10}

Although HCAs are benign, lesions larger than 5 cm have a relatively high risk of bleeding (25–40%) and an estimated risk of malignant transformation of approximately 5 per cent.^{11–13} For these lesions elective resection is generally accepted as treatment of choice and can be performed both through an open or laparoscopic approach.¹⁴ Although procedures such as transarterial embolization (TAE) and radiofrequency ablation (RFA) for HCAs have shown some promising results, these alternative treatment modalities are still not common practice.^{15–18}

Unlike HCA, FNH carries no risk of bleeding and malignant transformation and therefore,¹⁹ the need for resection is rare, and is only dictated by symptoms. The same holds for haemangioma.²⁰ A previous study from this department showed a consistent correlation between size and symptoms when focussing solely on haemangiomas.²⁰ For all benign liver tumours, however, the literature shows discordant outcomes concerning correlation of tumour size with symptoms.^{21,22}

In the typical case, a patient presents with persistent, severe upper abdominal symptoms influencing quality of life. Abdominal imaging shows a lesion in the liver, diagnosed as one of the benign liver tumours. The indication for resection of hepatocellular adenoma (HCA) >5 cm clearly is the risk for bleeding or for malignant degeneration. For smaller HCA or other benign lesions such as FNH or large haemangioma, abdominal complaints or patients’ discomfort may require treatment.

Some patients diagnosed with benign liver lesions may go on for years and years experiencing pain, seriously limiting their daily activities. This poses a dilemma for both patient and doctor, who ideally decide on treatment based on shared decision-making. Therefore, the primary focus of this study was to evaluate the effect of resection on relief of symptoms attributed to a benign liver tumour.

Short-term outcomes after resection of benign liver tumours in this cohort of patients have been reported previously. After a median follow-up time of 6 months, 88% of the patients reported relief of symptoms.²³ In order to investigate the sustainability of these results, long-term outcomes of resection have now been assessed in this cohort of patients with benign liver tumours.

Methods

Patient population

This study reports on the continued follow-up of a previously reported prospective study.²³ Included were patients who completed a baseline questionnaire prior to surgical intervention for a benign liver lesion. Written informed consent was obtained from all included patients and the local medical ethics committee

approved the protocol. The diagnosis of HCA, FNH, or haemangioma was confirmed by experienced liver pathologists.

Patients with other conditions possibly related to the abdominal symptoms were not included in this analysis. All patients diagnosed with HCA were treated according to the most recent guidelines in The Netherlands (resection for: impending rupture, suspicion of malignancy, tumour size above 5 cm in HCA, HCA in men and remaining tumour size above 3 cm after transarterial embolization).¹⁴ Only in patients with persisting, severe complaints, that did not respond to pain medication, excision of the lesion was proposed after all other possible causes of the pain had been excluded.

Assessment of symptoms

To quantify the experienced pain, patients were asked to fill in a questionnaire at baseline (prior to surgery), which was compared to questionnaires collected cross-sectionally at second assessment in February 2015, for long term-follow up (median 54 months after surgery, range 24–148 months). This questionnaire was an adapted version of the validated McGill Pain Questionnaire in its Dutch translation.^{24,25} It obtains information about the severity and nature of the pain experienced by the patient using the pain rating index (PRI) and the number of words chosen (NWC).

The PRI contains 62 pain descriptor items (PDI) which are divided into 20 subclasses, each containing an ordinal scale from 1 to 3 or 1 to 4 PDI. The 20 subclasses are again categorized in four major categories: sensory (S), max. 36 PDI; affective (A), max. 15 PDI; evaluative (E), max. 11 PDI and PRI total, max. 62 PDI. As its name indicates, the NWC counts the amount of words chosen per major category, and does not take into account the ordinal value of the “chosen” word itself (S, max. 12 words; A, max. 5 words; E, max 3 words; total max 20 words). If a patient chooses no PDI’s within a subclass, it scores 0 or “no pain”.

The Visual Analogue Scale (VAS) was used to measure the degree of pain and discomfort. Questions evaluating how the patient experienced the surgical procedure were included in the post-operative questionnaire. Patients were asked whether they experienced a change in their complaints after surgery, whether they developed new complaints and whether they would choose to undergo surgery again if they would stand for the same decision.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows Version 20 (IBM Corp., Armonk, NY, USA). An overview of the study population characteristics was obtained using descriptive statistics. Outcomes were evaluated using paired sample T-test (p -values <0.05). Logistic regression analysis included all factors that were significant in the uni-variable analysis (ANOVA) and (MANOVA) for PRI and NWC (Tables 2.1–2.3). No more than ten fixed factors were used in the

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