

# Systematic approach for benign liver lesions in non-cirrhotic livers

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(Index words: benign liver lesions, evaluation protocol)

## Abstract

**Introduction** Focal liver lesions are increasingly diagnosed in non-cirrhotic livers with widespread use of imaging. Arriving at an accurate diagnosis is challenging. Management of indeterminate lesions is not clearly defined. This paper looks at 101 non-malignant cases on the initial assessment and the outcome after three years of follow up.

**Objectives** To assess the outcome of 101 benign liver lesions on initial assessment.

**Methods** 136 lesions in non-cirrhotic patients underwent triphasic CT (Computed Tomography) scan in all, MRI in 56 cases, biopsy in 5 patients and all discussed in multidisciplinary meeting. After initial evaluation 101/136 were benign or likely to be benign. These were divided as having benign asymptomatic lesions (n=59), benign symptomatic lesions (n=9), benign but indeterminate lesions (n=33). Surgery was offered for symptomatic and potentially progressive lesions. Collective decision was taken in indeterminate lesions for surgery or follow up for three years.

**Results** Overall, 37% had haemangiomas, 24% had liver cysts, 8% had focal nodular hyperplasia (FNH), 5% had adenomas. 25% underwent surgery. These included 7/59 diagnosed lesions, nine symptomatic lesions and 8/33 indeterminate lesions. Of the 33 indeterminate lesions six turned out to be FNH after surgery. 24 lesions, which were followed up for three years, did not increase in size. None of the 101 benign lesions turned out to be malignant after surgery or follow-up.

**Conclusion** Benign lesions can be diagnosed safely with current imaging. Strong recommendation for follow up appears to be a safe strategy for indeterminate lesions.

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## Background

Focal liver lesions are increasingly diagnosed incidentally due to wide use of imaging modalities. The cornerstone of managing benign liver lesions is accurate diagnosis [1]. At times the diagnosis can become a

challenging task even with advanced imaging and biopsy [2]. Once a lesion is diagnosed as benign, it does not require follow-up. Thus it's important that a confident diagnosis is made. On the other hand, proportion of patients whom the diagnosis is vague pose a significant management challenge of offering resection or follow-up [3]. Different units follow different management approaches [4]. This paper looks at 101 non-malignant cases on the initial assessment and the outcome after three years of follow up.

## Methods

### Initial evaluation

From January 2012 to January 2015, 136 patients with ultrasonically detected focal liver lesions in non-cirrhotic livers were referred for further evaluation. Upon referral they underwent further imaging to confirm the diagnosis. After the initial evaluation, patients were discussed in a multidisciplinary meeting, which included hepatobiliary surgeons, radiologist, oncologist, pathologist and a hepatologist. After the multidisciplinary meeting, biopsy was done in carefully selected patients with suspicious Computed Tomogram (CT) or Magnetic Resonance Imaging (MRI) features. CT scan showed diagnostic features in 42 of the lesions, 26 of the lesions had diagnostic MRI features and 5/136 of the patients underwent a biopsy. 101 patients who were diagnosed to be having benign or likely to be benign lesions were the subjects of this evaluation (Figure 1). Benign lesions were diagnosed based on standard radiological criteria. These patients were divided in to three groups as asymptomatic lesions with benign diagnosis (n=59), symptomatic lesions with benign diagnosis (n=9) and likely benign lesions without a firm diagnosis (n=33).

### Clinical management

Symptomatic benign lesions were further evaluated to confirm whether symptoms could be attributed to the lesion. If symptoms were clearly related to the lesion, surgical treatment was offered. Surgery was further offered for benign lesions, which carries risk of future complications.

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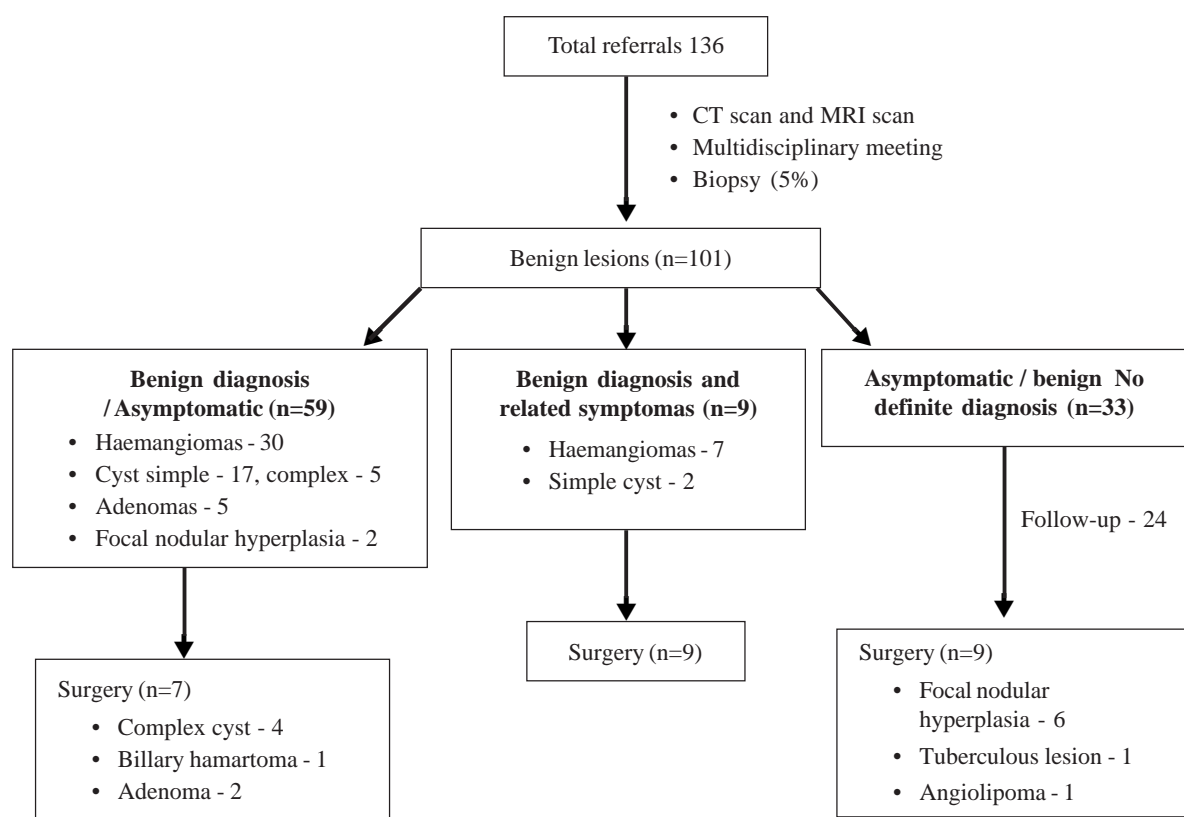


Figure 1. Management summary of 101 focal liver lesions.

Lesions, which were likely to be benign, were discussed with the patient and a collective decision for surgery or follow-up was taken. The follow-up included, every three monthly ultrasound scan (USS) assessment of size and texture. Two radiologists performed follow-up USS. Further evaluation with CT or MRI was done depending on ultrasound findings. If the lesions were stable for three years they were discharged from follow up.

In patients who underwent surgery, non-anatomical resection was preferred whenever possible. Major hepatectomy was offered in patients who had lesions located in major vascular pedicles. Laparoscopic or open approach was selected considering the location of the lesion. Neoplastic cysts were offered enucleation or formal hepatectomy decided on individual basis. All data were collected prospectively. The data was analyzed using SPSS v.20.

## Results

From the 101 patients analyzed, 57.6% (n=58) were females. Median age was 47 years (range 19-76). Upper abdominal pain and discomfort were the commonest presenting complaints to undergo initial USS in 57% (n=57). Of these patients with upper abdominal symptoms, 26 (46%) presented with right hypochondrial pain, 18 (31%)

had epigastric pain and 13 (23%) had abdominal fullness. Remaining 44% (n=44) of the lesions were detected incidentally with USS scan done for other reasons.

At the end of the evaluation, 37 (37%) of hemangiomas, 24 (24%) of liver cysts, 2 (2%) of focal nodular hyperplasia (FNH) and 5 adenomas (5%) were clearly diagnosed. 33 (33%) of the patients did not have a clear diagnosis but were considered benign. Out of the liver cysts majority of 75% (n=18/24) were simple liver cysts and 25% (n=6/24) were complex cysts.

Twenty-four percent (n=24) of the patients were followed up. 25% (n=25) underwent surgery for benign liver lesions. 29% (7/24) of the cysts underwent surgery. Two of these were symptomatic large simple cysts and 5 were biliary cystadenomas. 18.9% (7/37) of symptomatic haemangiomas underwent surgery. The median diameter of the resected haemangioma was 11 cm (7-14cm). 40% (2/5) of large (over 5 cm) adenomas and further 8 lesions underwent surgery. Of these 8, one was a tuberculous lesion, 6 were FNH and one was an angiolipoma.

The surgical procedures included minor hepatectomy (n=11), Cyst enucleation (n=4) and major hepatectomy (n=10). 5/25 laparoscopic procedures were done. The median operating time was 160 (80-290 min). The median blood loss was 290 (40-400 ml). There was one bile leak after cyst enucleation that was managed conservatively.

There were two minor complications (wound infection and stich granuloma). The median ICU (Intensive Care Unit) stay was 2 (1-3) days and the hospital stay was 6 (3-10).

In the group who were followed up, none of the patients showed a significant change in the size or radiological features that required resection during threeyear follow-up. In patients who underwent resection, pre-operative diagnosis was incorrect in 44% (n=11/25). Commonest lesion that was difficult to diagnose was FNH (54.5%, n=6/11). None of the benign lesions or indeterminate lesions turned out to be malignant after surgical resection.

## Discussion

In this cohort of 101 patients with radiologically benign liver lesions in non-cirrhotic livers, majorities were detected in incidental ultrasound scans. Commonest benign lesions were haemangiomas. Out of 33 indeterminate lesions which were likely to be benign, nine underwent resection and histology showed non-neoplastic lesions in all. Remaining 24 did not change in size during follow-up after three years. Out of all 25% were resected. FNH was the commonest lesion that was difficult to diagnose. None of the benign lesions turn out to be malignant.

The reported incidence of benign liver lesions are highly variable according to different authors [1,5,6]. Most papers report benign cyst as the commonest benign entity followed by haemangiomas [7]. In our experience, haemangiomas were the commonest. This probably could be related to the referral pattern, once the initial imaging is reported as simple cyst, all the cases are unlikely to be referred by the primary attending physician.

Upper abdominal symptoms were present in 57% of the patients. Nine of them had clearly related symptoms of abdominal pain, fullness or discomfort due to its size. Seven out of 30 haemangiomas were symptomatic and required resection. In previous data, around 25% of the haemangiomas are reported to be symptomatic [6]. A series by Belle *et al* [8] reported no response to pain after surgery for benign lesions in 8/40 patients and the group reported a new group of symptoms related to the surgical scar. In our series we were conservative in offering surgery for pain where only 9/57 patients with upper abdominal symptoms were offered surgery.

In the group without definite diagnosis (n=33), surgery was performed in 9 patients. None of these turned out to be malignant. None of the followed up lesions increased in size over period of three years. With the current imaging and systematic approach, the chance of missing a malignant lesion seems to be very limited. A multi-disciplinary approach is highly recommended in evaluating liver lesions [9]. Sinha *et al* [10] highlighted the value of multidisciplinary approach in evaluating

liver lesions and in their series of 200 patients nine had a change in the initial diagnosis in the follow-up. However, these were in patients with background liver disease. Mezhir [11] reported a significant drop in surgical resection of benign lesions over period of 15 years. In our patients, once patients themselves were given the options, nine opted for surgery. Though there were no mortalities in our group, there was one bile leak, which was managed conservatively. Morbidity related to surgery has been reported to be around 15-20% [3,12]. Especially with open surgery, symptoms related to surgical scar is also a concern [8,12]. Thus in this group of patients, a strong recommendation can be given for follow up rather than resection.

However, in this series, almost 44% of the resected lesions histological diagnosis was different to the initial radiological diagnosis. Most of the difficulties were with FNH and others were rare lesions. The number of resections performed for FNH is relatively high in this series. Almost all patients with HCC (hepatocellular carcinoma) in Sri Lanka are related to non-alcoholic fatty liver disease or alcohol [13]. 20% of the HCC are seen in non-cirrhotic background and higher proportion of these are fibro-lamellar HCC. FNH has inherent diagnostic confusion with fibrolamellar HCC [14,15]. This local factor led to offering surgery to these patients though the initial diagnosis was likely to be FNH.

## Conclusion

With current imaging and a multi-approach, benign lesions in non-cirrhotic livers can be managed safely. Strong recommendation for follow up appears to be a safe strategy for indeterminate lesions.

## Conflict of interests

All authors declare no conflict of interests.

## References

1. Trotter JF, Everson GT. Benign focal lesions of the liver. *Clin Liver Dis* 2001; **5**: 17-42.
2. Heiken JP. Distinguishing benign from malignant liver tumours. *Cancer Imaging* 2007; **7**: 1-14.
3. Hilal MA, Fabio FD, Teng MJ, Godfrey DA, Primrose JN, Pearce NW. Surgical management of benign and indeterminate hepatic lesions in the era of laparoscopic liver surgery. *Dig Surg* 2011; **28**: 232-6.
4. Kim J, Ahmad SA, Lowy AM, *et al*. An algorithm for the accurate identification of benign liver lesions. *Am J Surg* 2004; **187**: 274-9.
5. Mergo PJ, Ros PR. Benign lesions of the liver. *Radiol Clin North Am* 1998; **36**: 319-31.
6. Herman P, Costa ML, Machado MA, *et al*. Management

- of hepatic hemangiomas: a 14-year experience. *J Gastrointest Surg* 2005; **9**: 853-9.
7. Lantinga MA, Gevers TJ, Drenth JP. Evaluation of hepatic cystic lesions. *World J Gastroenterol* 2013; **19**: 3543-54.
  8. Rosmalen BV, Bieze M, Besselink MGH, *et al.* Long-term outcomes of resection in patients with symptomatic benign liver tumours. *HPB (Oxford)* 2016; **18**: 908-14.
  9. European Association for the Study of the Liver (EASL). EASL Clinical Practice Guidelines on the management of benign liver tumours. *J Hepatol* 2016; **65**: 386-98.
  10. Sinha A, Dhanda A, Collins P. PTH-122 Multidisciplinary team approach is accurate in diagnosing benign liver lesions. *Gut* 2015; **64**: 461-2.
  11. Mezhir JJ, Fourman LT, Do RK, *et al.* Changes in the management of benign liver tumours: an analysis of 285 patients. *HPB* 2017; **15**: 156-63.
  12. Hoffmann K, Unsinn M, Hinz U, *et al.* Outcome after a liver resection of benign lesions. *HPB(Oxford)* 2015; **17**: 994-1000.
  13. Siriwardana RC, Niriella MA, Dassanayake AS, *et al.* Clinical characteristics and outcome of hepatocellular carcinoma in alcohol related and cryptogenic cirrhosis: a prospective study. *Hepatobiliary Pancreat Dis Int* 2015; **14**: 401-5.
  14. Shamsi K, Schepper AD, Degryse H, Deckers F. Focal nodular hyperplasia of the liver: radiologic findings. *Abdom Imaging* 1993; **18**: 32-8.
  15. Carlson SK, Johnson CD, Bender CE, Welch TJ. CT of focal nodular hyperplasia of the liver. *Am J Roentgenol* 2000; **174**: 705-12.