The role of Ultrasound scan in assessing the biliary tree

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Introduction

Biliary tree obstruction is now a more commonly recognised condition with the increase incidence of gallstones in the UK and worldwide. Several studies have shown that clinical assessment and laboratory tests can identify up to 90% of patients with jaundice secondary to extrahepatic dilatation. However, accurate assessment often requires radiological imaging to confirm the presence, level, and cause of obstruction. Ultrasound scan (USS) is the initial imaging modality of choice in assessing biliary tree obstruction as the test is non-invasive, inexpensive, and readily available, but the result is operator dependent.

In this study we assessed:
1. Accuracy of USS performed in our department in establishing biliary dilatation.
2. Adequacy of USS reports generated by our department.
3. Usefulness of Liver function tests (LFTs) in predicting biliary obstruction as most of the requests by the clinicians for biliary imaging are based on abnormal LFTs.

Results

102 patients were involved in the study (Oct 2012–July 2013); female to male ratio was 1:6.1 with average age of 62.

MRCP examination demonstrated dilated biliary tree in 39 patients; of whom 32 were found to have the same finding on USS (sensitivity 82%). A total of 47 patients were found to have dilated biliary tree on USS.

USS failed to identify the cause of the biliary obstruction in all those patients who had dilated biliary tree except for one with pancreatic mass.

24 patients were found to have a cause for their biliary tree dilatation. CBD stone was the commonest cause (19 patients). Other causes were: pancreatic lesion, PCC (Figure 1).

The absence of biliary tree dilatation did not rule out the presence of biliary obstruction. 8 patients had obstructive lesion with normal biliary tree calibre.

Liver function test was found to be a poor predictor for biliary obstruction. 45 patients had obstructive pictures but only 15 of them had obstructive lesion on MRCP scans. On the other hand, 14 patients had biliary obstruction with normal bilirubin level. GTT was the only sensitive marker for the presence of biliary obstruction (sensitivity exceeding 90%).

The majority of the scans were performed by sonographers (85 scans) vs 17 done by radiologists.

The radiologists missed one dilated biliary tree (5.2%), while 6 were missed by the sonographer (7%). The word [biliary dilatation] was not used in 6 reports in the presence of dilated biliary tree and all of them were reported by sonographers. Recommendation for further evaluation was mentioned in only 6 reports.

![Causes of CBD dilatation (Figure 1)](image)

Methodology

The picture archiving and communication system was used to retrieve all the biliary USS requests that were followed by MRCP examination within 6 weeks. The USS findings were cross checked with the MRCP results to check their accuracy. All USS reports were also checked for:
1. If the word “Biliary tree dilatation” was mentioned in the presence of dilated biliary tree.
2. Recommendation for further imaging when biliary dilatation was identified on USS and no cause was seen.

We also checked the LFT results, using our electronic database pathology system, performed prior to the radiological imaging, examining their value in predicting biliary tree obstruction.

Conclusion

USS is a sensitive and a low cost tool to look for biliary pathology, however our department failed to achieve 90% sensitivity. LFTs is a poor predictor for biliary obstruction and has to be taken in the context of the clinical presentation. We failed to achieve 100% target in providing key elements on USS reports in the presence of abnormal findings. The audit will be presented in the next departmental meeting to discuss service improvement and re-audit after changes have been implemented.

References:

9. Royal College of Radiologist website.