Routine magnetic resonance cholangiopancreatography and intra-operative cholangiogram in the evaluation of common bile duct stones

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ABSTRACT

INTRODUCTION Magnetic resonance cholangiopancreatography (MRCP) is a safe and sensitive investigation for the imaging of common bile duct pathology. When used to exclude common bile duct (CBD) stones, MRCP may obviate the need for intra-operative cholangiogram (IOC). In this prospective study, we looked at the single centre results of patients who underwent cholecystectomy with IOC following pre-operative MRCP.

PATIENTS AND METHODS Over a period of 18 months, 69 patients (24 male and 45 female; mean age 59 years [range, 19–86 years]) were investigated by MRCP prior to cholecystectomy. All patients underwent IOC. Inclusion criteria for MRCP consisted of derangement of liver function tests and/or history of jaundice in cases of ultrasound-proven cholelithiasis.

RESULTS Sixteen patients had suspected stones or filling defects on MRCP; all but two of these were confirmed to be stones on IOC. In only one patient was a stone visualised on IOC and not seen on MRCP.

CONCLUSION MRCP may be the only pre-operative investigation needed for exclusion of CBD stones, obviating the necessity for IOC.

KEYWORDS

Cholelithiasis – MRCP – Cholangiogram

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Magnetic resonance cholangiopancreatography (MRCP) is increasingly replacing diagnostic endoscopic retrograde cholangiopancreatography (ERCP) in the initial assessment of patients suspected biliary obstruction,¹ with ERCP being reserved for the removal of confirmed stones in choledocholithiasis.² However, the optimum method of investigating suspected common bile duct stones is still under debate. MRCP has been shown to be sensitive and specific in the evaluation of choledocholithiasis when compared to ERCP.^{3–6} It is generally well tolerated⁷ and avoids the potential complications of ERCP when used as a diagnostic modality. It has high sensitivity and specificity in the initial evaluation of patients with clinical obstructive jaundice and could replace the direct cholangiography when is used for diagnostic purpose.⁸ However, the value of information gained at MRCP may be limited if patient selection is inappropriate.⁹

The role of routine operative cholangiography is also debated with proponents advocating its use in all cholecystectomies in order to reduce bile duct injuries.¹⁰ A move to a more selective approach has also been recommended and has been shown to be safe, cost effective and not to increase post-operative complications.¹¹ Its role in identifying uncertain anatomy and visualising choledocholithiasis is well established.¹² However, whether IOC provides useful additional information following a normal pre-operative MRCP, when at operation the anatomy is judged to be clear, is not known.

When compared with direct cholangiography, (ERCP, PTC and IOC), MRCP has again found to be both sensitive and specific. However, in these studies the numbers of IOCs included have been very small,^{3,13,14} and the question of whether a pre-operative MRCP can obviate the need for IOC still remains. We, therefore, conducted this prospective study comparing routine IOC with pre-operative MRCP.

Patients and Methods

Sixty-nine patients who underwent cholecystectomy with IOC following a pre-operative MRCP were included in this prospective study over an 18-month period from January 2000. Informed consent was obtained from all patients. Patients were recruited from a single centre and managed by one of two consultants following similar protocols. Inclusion criteria consisted of derangement of liver function tests or amylase and/or history of jaundice in cases of ultrasound-proven cholelithiasis. ERCP was used selectively in patients with confirmed CBD obstruction and these patients were excluded from the study. MRCP was performed in all patients within 6 weeks of cholecystectomy using an IGE Horizon LX® 1.5 T MR unit, through a non-breath-hold, respiratory-triggered, fat-suppressed, two-dimensional, heavily T2-weighted fast spin-echo sequence in the coronal plane.

Failed cannulations were excluded from this study (5% in our unit); however, patients requiring conversion from laparoscopic to open cholecystectomies were included as long as an IOC was performed.

IOCs were performed using Hypaque dye injected into the cystic duct via a 22-G infant feeding tube and images captured using a Philips image intensifier. A single radiologist reported the MRCPs. The operating surgeon initially assessed the IOCs, the hard films being subsequently reported by a single, blinded radiologist. In those cases where IOC revealed choledocholithiasis, ductal exploration or postoperative ERCP were used depending on the managing consultant.

Results

Of the 69 patients included in this study, 15 had gallstone pancreatitis with a raised amylase in addition to raised LFTs. Of the 69 cholecystectomies performed, 4 were converted to open procedures. There were 24 men and 45 women, mean age 55 years (median, 89 years; range, 12–89 years). CBD dilatation was reported in 23 patients at MRCP and 13 at IOC. Sixteen had suspected stones or filling defects on MRCP; 14 of these were confirmed to be stones on IOC and were removed either by duct exploration or at postoperative ERCP. In one patient, IOC demonstrated a calculus not seen on MRCP; postoperative ERCP revealed this to be a 4-mm stone. MRCP incorrectly predicted the presence of calculi in 2 patients. Thus MRCP sensitivity was 93% and specificity 96%.

Discussion

In this study, the sensitivity and specificity of MRCP is similar to studies where MRCP and direct cholangiography

have been compared;^{3,13,14} this might be expected. In comparison to the routine use of IOC, using pre-operative MRCPs reduces operative time, is less invasive and may also reduce unnecessary damage occurring to the CBD in attempting to perform IOC. We feel that in cases where MRCP has been performed and the CBD reported as clear, IOC can be reserved for elucidating uncertain anatomy. Routine IOC following a normal MRCP cannot in our opinion be justified. Reducing the number of IOCs performed will minimise radiation doses and have time-saving implications though the authors acknowledge that the availability of MRCP is limited in some centres.

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