Factors associated with spontaneous passage of radiologically confirmed CBD stones through a virgin duodenal papilla

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Introduction Spontaneous passage of common bile duct (CBD) stones is a commonly observed clinical phenomenon that eliminates the need for invasive and costly endoscopic retrograde cholangio-pancreatography (ERCP). The aim of this study was to identify factors associated with spontaneous passage of CBD stones before index ERCP.

Methods This retrospective study was conducted in a university teaching hospital. It included patients with a virgin duodenal papilla who underwent ERCP to remove radiologically confirmed CBD stones between April 2018 and October 2019. The primary outcome was the presence/absence of stones on cholangiography where absence indicated spontaneous passage since radiological detection. Data collected retrospectively included patient demographics; scan modality to confirm stones; scan to ERCP time interval, stone number (single vs multiple); largest stone size (mm) and liver function tests (LFT) pre-ERCP.

Student t test was used for comparison of categorical and numerical variables. Chi-Squared test for comparison of categorical variables and Mann Whitney for comparison of the scan to ERCP time intervals. A binomial logistic regression was performed on a subgroup of patients for whom stone size was documented.

Results 427 patients underwent an index ERCP within the study period. Following application of the exclusion criteria 360 patients were included in the final analysis. The absence of a CBD stone on cholangiography was observed in 50 (13.9%) patients. Mean age was 68.1 +/- 16.8 years (Females 52.8%). CBD stones were confirmed by different imaging modalities (MRCP: 273, CT scan: 66, USS: 21). The presence of a single CBD stone on imaging was significantly associated with stone passage; 176 (48.9%) patients had a single CBD stone (P < 0.05), 62% (31/50) of passed stones were single.

In a subgroup analysis of 142 patients in whom stone size was documented, stone size was found to affect CBD stone passage. Mean stone size of 7.4 +/- 3.04 mm was observed in patients with spontaneous passage (15 patients) vs 9.77 +/- 4.76 mm in those who did not (127 patients), P < 0.014. However, on multivariate binomial logistic regression analysis of this subgroup no factors achieved statistical significance including stone size (OR 0.837).

No significant association observed between stone passage and age (P = 0.108), gender (P = 0.50), abnormal LFTs Pre-ERCP (P = 0.40) or the median scan to ERCP time interval [Median of 4 days (IQR 3, 7.25) and 5 days (IQR 3, 24) days respectively (P = 0.075)].

Conclusions A significant proportion of CBD stones will spontaneously pass. This study suggests solitary stones are more associated with spontaneous passage than multiple stones. A robust prospective study is needed to further investigate if stone size has any significant influence on spontaneous CBD clearance.