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Juxtapapillary Diverticulum And ERCP In Biliary Stone Disease: Challenge Or Myth? A 19-Year Moroccan Experience

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Abstract
Background: Juxtapapillary diverticula (JPD) are common anatomical variations encountered during endoscopic retrograde cholangiopancreatography (ERCP) and may render biliary cannulation more difficult. The true magnitude of their impact on ERCP outcomes, however, remains debated.
Objective: To determine the prevalence of JPD and evaluate its effect on biliary cannulation success and early complications among patients undergoing ERCP for common bile duct (CBD) stones.
Methods: A retrospective analysis was performed of 1,203 ERCPs for choledocholithiasis conducted between April 2005 and April 2024. Patients were classified according to the presence or absence of a juxtapapillary diverticulum. Cannulation success and early complications were compared.
Results: The mean age was 58 ± 13 years, with 738 women and 465 men (sex ratio H/F = 0.64). A juxtapapillary diverticulum was identified in 104 patients (8.6%). The biliary cannulation success rate was 93.3% in patients with JPD versus 96.8% in those without (p = 0.048). Early complications occurred in 6.7% and 6.0% of patients, respectively (p = 0.64).
Conclusion: The presence of a juxtapapillary diverticulum was associated with a slight but statistically significant reduction in cannulation success, without an increase in early complications. These findings are in keeping with most published series and suggest that, although JPD remains a technical challenge, it does not represent a major barrier to successful ERCP in experienced hands.

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I. Introduction

Juxtapapillary or periampullary diverticula are mucosal outpouchings arising from the duodenal wall within a few centimeters of the major papilla. They are reported in 6–20% of ERCP cases, most frequently in elderly patients and those with biliary lithiasis. The papilla may be displaced to the margin or even inside the diverticulum, altering its orientation and rendering biliary cannulation technically demanding. Although early series described them as a cause of ERCP failure, recent reports suggest only a modest reduction in success rate when expert endoscopists use advanced cannulation techniques.

In this context, we aimed to determine the prevalence of juxtapapillary diverticulum in Moroccan patients undergoing ERCP for common bile duct stones, and to evaluate its influence on the success rate of CBD cannulation and the occurrence of early complications.

II. Materials And Methods

This retrospective single-center study included 1,203 patients who underwent ERCP for choledocholithiasis between April 2005 and April 2024. The presence of a juxtapapillary diverticulum was recorded during ERCP. Patients were divided into two groups: those with JPD (Group I) and those without JPD (Group II).

Data collected included age, sex, cannulation success, and early complications (post-ERCP pancreatitis, bleeding, or cholangitis). Statistical analyses were performed using Chi-square or Fisher's exact test, with $p < 0.05$ considered significant.

III. Results

A total of 1,203 patients were included. The mean age was 58 ± 13 years, ranging from 23 to 89 years. Women represented 61.3% of the cohort (738 cases), while men accounted for 38.7% (465 cases), giving a sex ratio H/F = 0.64.

Juxtapapillary diverticulum was identified in 104 patients (8.6%), while 1,099 patients (91.4%) had no diverticulum. The demographic characteristics of both groups were comparable.

Biliary cannulation was successful in 93.3% of patients with JPD (97/104) compared with 96.8% in those without (1,064/1,099; p = 0.048).

Early complications occurred in 6.7% of the JPD group (7 patients) and 6.0% of the non-JPD group (66 patients; p = 0.64). The most frequent complication was mild post-ERCP pancreatitis, followed by self-limited bleeding. No procedure-related deaths occurred.

Variable	With JPD (n=104)	Without JPD (n=1,099)	p value
Mean age (years)	59 ± 12	58 ± 13	0.47
Female, n (%)	66 (63.5)	672 (61.1)	0.63
Male, n (%)	38 (36.5)	427 (38.9)	0.63
Outcome	With JPD (n=104)	Without JPD (n=1,099)	p value
Successful CBD cannulation	93.3% (97/104)	96.8% (1,064/1,099)	**0.048**
Early complications	6.7% (7/104)	6.0% (66/1,099)	0.64
Post-ERCP pancreatitis	3.8%	3.4%	0.81
Bleeding	1.9%	1.4%	0.66
Cholangitis	1.0%	1.2%	0.87

IV. Discussion

Our large retrospective series demonstrates that juxtapapillary diverticula were present in approximately 9% of patients undergoing ERCP for bile duct stones. This prevalence is consistent with previously reported rates ranging between 6% and 20%. Patients with diverticula tended to be older, supporting the idea that these lesions are acquired and related to age-related duodenal wall weakness. The success rate of common bile duct cannulation in our study was slightly but significantly lower in patients with diverticula (93.3%) compared with those without (96.8%). Although the difference is modest, it highlights the technical challenge that diverticula can pose during ERCP. This trend aligns with contemporary studies showing a small reduction in cannulation success when a diverticulum is present.

The anatomical configuration of the papilla within or adjacent to a diverticulum can obscure its visualization and alter the axis of cannulation, increasing procedural difficulty. In addition, peridiverticular fibrosis or inflammation may further complicate the passage of the cannula. Despite these challenges, our findings confirm that experienced operators can achieve high success rates without significantly increasing complication rates.

Early complications occurred at similar rates in both groups (6.7% vs 6.0%), consistent with previously published data. No increase in post-ERCP pancreatitis or bleeding was observed. These results support the notion that, although juxtapapillary diverticula may prolong procedure time, they do not compromise patient safety when managed appropriately.

Our study's strengths include its large sample size and long observation period, reflecting real-world ERCP practice. However, its retrospective design and the absence of data on diverticulum size, papillary position, and operator experience are limitations. Future prospective, multicenter studies stratifying diverticulum type and technical approach would further clarify the relationship between juxtapapillary diverticula and ERCP success.

V. Conclusion

In this 19-year Moroccan experience including 1,203 patients with choledocholithiasis, juxtapapillary diverticulum was found in 8.6% of cases. Its presence was associated with a slight but statistically significant reduction in the success rate of common bile duct cannulation (93.3% vs 96.8%), without an increase in early complications. These findings indicate that juxtapapillary diverticulum, though a technical challenge, does not represent a major obstacle to successful ERCP when performed by experienced operators.

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