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Risk factors for nephrolithiasis in patients with ileal pouches ☆

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Abstract

Background and aims: Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) has become a standard of care in patients with ulcerative colitis (UC). Nephrolithiasis is common in patients with inflammatory bowel disease (IBD), but has never been studied as a complication of IPAA. We aimed to assess the risk factors for nephrolithiasis in patients with IPAA.
Methods: Using an IRB-approved, prospectively maintained pouch registry, we identified 1221 patients between 2000 and 2010. Those with post-IPAA nephrolithiasis served as the study group whereas IPAA patients without nephrolithiasis served as the controls. Demographic and clinical variables were analyzed using multivariable logistic regression to identify risk factors.

Abbreviations: 5-ASA, 5-acetylsalicylic acid; 6-MP, 6-mercaptopurine; ALT, alanine transaminase; AST, aspartate transaminase; BMD, bone mineral density; BUN, blood urea nitrogen; CD, Crohn's disease; CI, confidence interval; CT, computed tomography; EIM, extra-intestinal manifestations; GFR, glomerular filtration rate; Hb, hemoglobin; IPAA, ileal pouch-anal anastomosis; IPS, Irritable pouch syndrome; IRB, Institutional review board; IBD, Inflammatory bowel disease; MRI, Magnetic resonance imaging; MTX, methotrexate; NSAID, non-steroid anti-inflammatory drugs; OR, odds ratio; mPDAI, modified Pouchitis Disease Activity Index; UC, ulcerative colitis; US, ultrasound; TNF, tumor necrosis factor; UTI, urinary tract infection.

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Results: There were a total of 218 IPAA patients: 81 with nephrolithiasis (37%) and 137 without (63%). Of the 81 patients in the study group, 17 were excluded due to limited clinical data. Three risk factors were found to be associated with nephrolithiasis: the presence of extra-intestinal manifestations (odd's ratio [OR] = 2.9, 95% confidence interval [CI]: 1.4, 5.8, $p = 0.003$), no use of antibiotics (OR = 3.2, 95% CI: 1.5, 6.5, $p = 0.002$) and low serum bicarbonate level (OR = 0.87, 95% CI: 0.77, 0.99, $p = 0.038$).
Conclusion: Nephrolithiasis was a common finding in our patients with IPAA. As pouch patients with nephrolithiasis can develop adverse clinical complications, those with at least one of the risk factors we identified may need to be monitored more closely and possibly receive prophylactic treatment with oral bicarbonate.

1. Introduction

Ulcerative colitis (UC) is the most common form of inflammatory bowel disease (IBD) worldwide. Despite advances in medical therapy, approximately 30% of patients with UC eventually require colectomy.[1,2] Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) has become a standard of care in UC patients following colectomy. While restorative proctocolectomy with IPAA improves patients' health-related quality of life, a number of metabolic complications can occur, including bone loss,[3] anemia[4] and vitamin D deficiency,[5] along with pouchitis, cuffitis, and de novo Crohn's disease (CD) of the pouch (Fig. 1).

Patients with IBD are known to have a high frequency of nephrolithiasis. The reported frequency of nephrolithiasis ranges from 0.2% to 11.0%[6–9] in non-colectomy UC patients and from 8.4% to 40.0% in UC patients with total colectomy and ileostomy.[6,8,10] Similarly, the reported frequency of nephrolithiasis ranges from 4.0% to 5.5% in patients with CD without bowel resection surgery[8,10] and from 15.0% to 30.5%[8,10] in CD patients after small bowel surgery. Various fluid and electrolyte changes in these patients increase the risk for nephrolithiasis. Low urine volume, pH, and urine citrate and magnesium levels along with high urine oxalate are speculated to be the main mechanisms for urinary supersaturation and nephrolithiasis in IBD patients. We anticipate that pouch patients (with a prior history of IBD) after undergoing bowel-anatomy-altering surgery may have a further increase in risk for nephrolithiasis.

In our clinical practice at the subspecialty Pouchitis Clinic, we noticed a significant number of patients with asymptomatic and symptomatic nephrolithiasis. In theory, pouch patients with frequent and loose stools have lower urine volume and/or lower urine pH than healthy

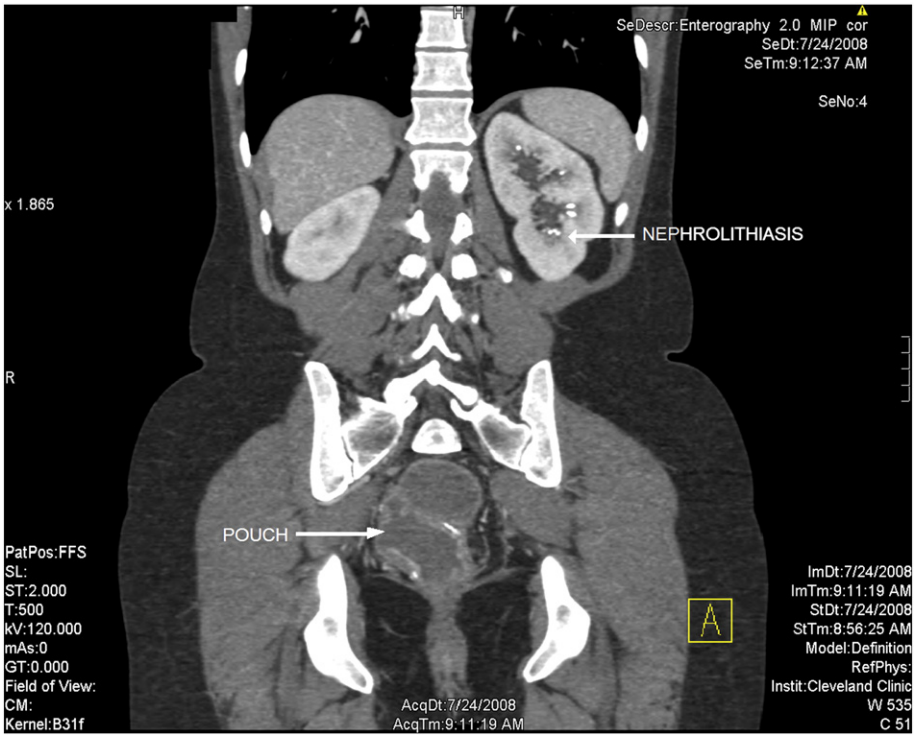

Figure 1 CT abdomen image showing nephrolithiasis in a patient with an ileal pouch.