

# Rendezvous procedure for choledocholithiasis in a Canadian rural surgical service

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■ Cite as: *CMAJ* 2023 April 11;195:E513-4. doi: 10.1503/cmaj.221707

Patients living in remote and rural Canada often travel long distances to access medical services. Choledocholithiasis is typically managed in 2 stages: an endoscopic retrograde cholangiopancreatography (ERCP) followed, days or weeks later, by a laparoscopic cholecystectomy (LC).<sup>1,2</sup> Given the substantial travel burden and loss to follow-up experienced by patients with choledocholithiasis, surgeons at the Sioux Lookout Meno Ya Win Health Centre (SLMHC) in northwest Ontario have adopted a 1-stage approach: the rendezvous procedure. This provides treatment in 1 hospital admission with a single anesthetic, so that patients receive high-quality treatment closer to home.<sup>3</sup>

## What is the rendezvous procedure?

The rendezvous procedure combines a simultaneous ERCP and LC for the management of suspected or confirmed choledocholithiasis and was first described in Montreal in 1993.<sup>3</sup> The LC surgeon introduces a guidewire into the cystic duct, through the common bile duct and out the ampulla of Vater. The “rendezvous” occurs when the endoscopist receives the guidewire, which facilitates common bile duct cannulation and stone extraction into the duodenum. Performing the ERCP and LC simultaneously provides similar, and possibly better, rates of stone removal and shorter total lengths of stay (by 3 days).<sup>4,5</sup> A 2018 systematic review and meta-analysis of 20 studies ( $n = 2489$ ) compared the efficacy and safety of 4 combinations of laparoscopic and intraoperative techniques and found the rendezvous procedure had the highest success rate and lowest morbidity compared with LC with either a pre- or post-ERCP or laparoscopic common bile duct exploration techniques.<sup>4</sup> The procedure avoids the high-pressure retrograde injection of contrast medium and improves the selective cannulation of the common bile duct, resulting in less ERCP-induced pancreatitis.<sup>6</sup>

The rendezvous procedure has the same morbidities as other techniques but at lower rates. A 2020 systematic review ( $n = 10611$ ) found less postoperative pancreatitis than in the 2-stage management group (odds ratio [OR] 0.26,  $p = 0.0003$ ) and overall lower morbidity (OR 0.41,  $p < 0.0001$ ); the rates of stone clearance were not significantly different (OR 2.20,  $p = 0.10$ ).<sup>5</sup> Although the rendezvous procedure is safe and effective, it is not standard management at most centres, in part owing to the logistics of ensuring that both an endoscopist and a laparoscopic surgeon

## Key points

- Patients living in rural and remote Canada often have to travel long distances to receive medical care, which can have considerable safety, financial and personal costs.
- Patients with choledocholithiasis usually undergo a 2-step procedure, requiring multiple trips from their home community and interhospital transfers.
- At the rural Sioux Lookout Meno Ya Win Health Centre, we have introduced a 1-step rendezvous procedure that has decreased patient travel and hospital admissions.
- We have introduced a focused quality assurance process and our outcomes meet international quality standards.

are present, and the potentially longer operating room time.<sup>5</sup> At SLMHC, a rural 65-bed facility, ERCP and laparoscopic procedures are provided by 3 general surgeons.

## What problem does the rendezvous procedure address?

In northwest Ontario, health care services are provided to a population of 30000 who live in an area of 385000 km<sup>2</sup>, including 26 remote First Nations communities. Previous research documented a regional rate of gallbladder disease 1.6 times the provincial rate.<sup>7</sup> Most patients require air transportation to access surgical services.<sup>7</sup> A 1-stage procedure limits the burden of travel required by 2 procedures that occur days to weeks apart. For patients in rural and remote Canada, the time between procedures is often much longer because of delays in travel caused by weather and patients being hard to contact between procedures and at increased risk of becoming lost to follow-up.

## What is the local evidence for the benefits of the rendezvous procedure?

In 2019, the rendezvous procedure became standard management for patients with choledocholithiasis at SLMHC when a general surgeon with ERCP skills joined the surgical team. Patient travel has been reduced; all but 2 of 25 patients were treated with only a single transfer from their community to Sioux Lookout. Historically, from 2007 to 2009, patients with choledocholithiasis who required a preoperative ERCP in a tertiary care centre, followed by LC at

SLMHC, averaged 6 medical transfers, as initial assessment, imaging, ERCP and LC were often performed in different centres.<sup>7</sup> Interhospital transfers and delays in surgery have been shown to increase patient morbidity, rates of conversion to an open procedure and hospital length of stay.<sup>1,8,9</sup>

## What resources are needed to perform the rendezvous procedure in a rural hospital?

Hospitals require both ERCP and LC capacity, which means that in the absence of an endoscopist, general surgeons need to acquire specialized skills. Our surgeon recently graduated from a residency program that provided tailored training on the ERCP skills needed for the program. Endoscopic and surgical staff must be committed to the program and willing to coordinate services, so 2 physicians are available at the same time. In Sioux Lookout, community fundraising collected the \$177 000 needed to buy the endoscopic and fluoroscopy equipment. However, the rendezvous procedure also saves resources, as there are fewer admissions to hospital, shorter total hospital stays and fewer air transfers for patients.<sup>5</sup>

## How many procedures must be done to achieve quality outcomes?

With the introduction of a new procedure, a focused quality-assurance process should be adopted. We are not aware of any volume recommendations for the rendezvous procedure specifically, although complication rates of ERCP increase when fewer than 40 procedures are performed annually.<sup>10</sup> Volumes of ERCP at SLMHC were affected by hospital service closures in response to the COVID-19 pandemic in 2020 and 2021 and averaged 31 cases per year; we anticipate performing more than 45 procedures in 2023.

Our surgeons have a quarterly program review with an ERCP provider in Thunder Bay who supervised their residency training and has adopted an ongoing quality-assessment program documenting clinical success and complications. The recommended clinical goals of successful cannulation and stone removal rates of 80%–90% and low morbidity (< 10%) have been achieved at SLMHC.<sup>10</sup> Of the 25 procedures performed between June 2019 and September 2022, common bile duct stones were found in 24 of the 25 surgeries; stone removal was successful in 20 patients (2 were stented locally for future successful stone removal and 2 required transfer to tertiary care centres). Successful cannulation was achieved in 23 of 25 cases, and 1 patient had mild post-ERCP pancreatitis. The average length of hospital admission was 2.2 ± 1.3 days (± standard deviation). The average operating time of 139 ± 51.6 minutes is within international ranges of 127–215 minutes.<sup>4</sup>

## What can be expected in the future?

Attempts to decrease the cost and patient and family burden of medical transportation must be balanced with a focus on quality of care. Other rural hospitals may wish to establish programs similar to ours. Some patients will require transfer to a larger centre; we hope that because of the burden of travel, those centres will consider a single intervention for these patients with choledocholithiasis.

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**Competing interests:** None declared.

This article has been peer reviewed.

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**Contributors:** Matthew Parkinson contributed to the conception of the work. Jenna Poirier and Len Kelly contributed to the design of the work. Len Kelly drafted the manuscript. Matthew Parkinson and Jenna Poirier revised the manuscript critically for important intellectual content. All of the authors gave final approval of the version to be published and agreed to be accountable for all aspects of the work.

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**Funding:** The study was supported by a grant from the Northern Ontario Academic Medicine Association Clinical Innovation Opportunities Fund.

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