Endoscopic retrograde cholangiography and endoscopic papillotomy in patients with a previous Billroth-II resection

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SUMMARY Methods for endoscopic retrograde cholangiography (ERC) and endoscopic papillotomy (EPT) in patients with Billroth-II operations are described, and experience with their use during the last four years (since 1980) is presented. Endoscopic retrograde cholangiopancreatography was successful in 134 of 147 patients (92%) and endoscopic papillotomy was successful in 46 of 50 patients. The described methods were used in two different hospitals by two different endoscopists and there was no difference in the results. We conclude that patients with a Billroth-II operation may undergo endoscopic diagnostic as well as therapeutic procedures with a high rate of success, with similar results as in ordinary patients and with no greater risk of complications.

Endoscopic retrograde cholangiopancreatography and endoscopic papillotomy are valuable diagnostic and therapeutic methods in patients with biliary and pancreatic disease. Endoscopic retrograde cholangiopancreatography has become a standard procedure in most major hospitals, and endoscopic papillotomy is also widely used for removal of common bile duct calculi. The success rate of these methods has increased with improved skill and better instruments. In patients with Billroth-II partial gastrectomy the endoscopist is presented with additional problems: 

1. Difficulties in entering the afferent loop, depending on the surgical techniques used. 
2. The endoscope may be too short to reach the papillary region unless the loops are successfully straightened out ("short route"). 
3. Difficulties in passing the ligament of Treitz, especially in patients with Braun’s entero-anastomosis or a long afferent loop. 
4. Problems in cannulating the papilla and especially the common bile duct from a reversed position. 
5. Problems in carrying out a papillotomy in a correct direction.

This paper presents the results of the experience obtained in two different hospitals, with special emphasis on description of the methods used to cope with the specific difficulties in endoscopic diagnoses and treatment of biliary diseases.

Methods

Patients

During the last four years (1980–1984), we have carried out 4967 diagnostic and therapeutic ERCP’s at Ullevål Hospital and Central Hospital of Akershus. Of these, 787 were endoscopic papillotomies mainly for choledocholithiasis.

ERCP in Patients with Billroth-II (B-II)

Within the same period, in a consecutive series, 147 patients aged 33–89 years (110 men, median age 69 years), with previous B-II gastrectomy were admitted for ERCP (Table 1). Patients with a Roux-

Table 1 Patients with Billroth-II resections admitted for endoscopic retrograde cholangiography (ERC) and endoscopic papillotomy (EPT) in two different hospitals, Ullevål Hospital (UH) and Central Hospital of Akershus (CHA)

<table>
<thead>
<tr>
<th>UH</th>
<th>CHA</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>ERC</td>
<td>EPT</td>
<td>ERC</td>
</tr>
<tr>
<td>73</td>
<td>23</td>
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en-y were excluded from this study, but patients with a Braun's enteroanastomosis were included. Two patients were excluded because diagnosis was reached before the ERCP. In one, symptoms were caused by occlusion of the afferent loop by an intraluminal tumour, and in the other, ulceration due to remaining silk sutures occluded the entry of the afferent loop to the stomach.

The conventional side viewing duodenoscopes (Olympus JF) were used in almost all patients. The stiffest types (JF-1T-3-7) of endoscopes available were used, in order to avoid the problems of long loops in the afferent bowel.

In many patients there were major difficulties in entering the afferent loop. This was because of the surgical procedure with an extra angling of the afferent loop at the lesser curvature. We often carried out this procedure during continuous fluoroscopy with little air insufflation. In some cases biopsy forceps inserted into the afferent loop were used as a guide wire during the intubation procedure.

After successful intubation of the afferent loop, we tried to enter the duodenum with little air insufflation, in order to enter the duodenal bulb by a 'short' route. From this position most of the long loops of the endoscope could be straightened out (Fig. 1). By slow retraction of the endoscope from this position the minor papilla, and by further retraction the major papilla could be seen. If the bile ducts were the target for the examination, the first cannulation attempts were carried out at a distance from the papilla with the tip of the endoscope close to the lower duodenal angle. This cannulation was done with a straight (new) cannulation catheter (Fig. 2). If this position failed, we attempted to cannulate the papilla inversely with a specially designed catheter from a closer position (Fig. 3). This catheter was preformed by heating before the examination.

In the present series of patients (n=134) biliary calculi were found in 81, 61 with calculi in the common bile duct. Periampullary malignancy was seen in four patients. Pancreatic disease was found in 13 patients, and malignant strictures in the common bile duct in three. Thirty three patients had no abnormalities.

**Endoscopic Papillotomy in Patients with a Billroth-II Operation**

Indication for endoscopic papillotomy was present in 50 of the patients: in 46 for removal of calculi and in four for fistulating malignant obstruction (n=4).5

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**Fig. 1** Radiographs showing straightening of a long loop in order to obtain a short route with better working facilities in a patient with a Billroth-II resection.
Endoscopic papillotomy was not attempted in 15 of the patients with common bile duct calculi. These patients were too young and were fit for surgery (n=7) or had an intact gall bladder and contraindications to surgery were minor, or absent (n=8).

**ENDOSCOPIC PAPILLOTOMY WITH A 30–30 PAPILLOTOME (Fig. 4)**

After successful diagnostic procedure this papillotome was introduced into the duct from a distal position (Fig. 5). The cutting wire was tightened with the papillotome in the upper part of the common bile duct, and the endoscope pushed higher up in the duodenum (Fig. 6). From this position the papillotome was retracted slowly until a correct position for papillotomy was obtained (Figs. 7–8). In four of the cases a precut procedure (Fig. 9) was used to facilitate the introduction of the papillotome.

**SUPRAPAPILLARY FISTULA**

Suprapapillary fistula into the common bile duct was done with a closed Dormia basket connected to a diathermy source (Fig. 10). A traditional papillotome was inserted into this fistula and then in a distal direction through the papillary opening (Fig. 11). In this position an inverse papillotomy was done.

When the above techniques were not possible, the standard method for endoscopic papillotomy as described by Safrany was used, but we tried to turn the papillotome in a position with a lesser possibility of damaging the pancreatic duct. All examinations were done by the authors.

Further details concerning endoscopic technique are given elsewhere.

**Results**

**ENDOSCOPIC RETROGRADE CHOLANGIOGRAPHY**

Endoscopic retrograde cholangiography was successfully undertaken in 134 of 147 patients (92%). There was no difference between the two hospitals in the success rate. Failures were caused by difficulties in entering the afferent loop (n=2), difficulties in entering the duodenum in patients with a Braun anastomosis (n=2), discomfort during the procedure (n=2), failure to see the papilla within...
the duodenum (n=4), and perforation of the duodenum at the duodenojejunal junction (n=1).

Endoscopic Papillotomy
Endoscopic papillotomy was successfully done in 46 of the 50 patients (92%) with removal of stones or formation of a permanent fistula above the papillary tumour. Most therapeutic manoeuvres were accomplished in a single procedure (Table 2). In 28 of the patients the 30–30 papillotome was used successfully, in another 15 the suprapapillary fistulotomy was used successfully, and in the remaining three patients the precut technique was used.\(^4\) In two of the patients in whom endoscopic papillotomy was indicated we failed, owing to difficulties in getting the papillary region into a correct position. These patients were admitted for surgery, with good results. In two patients substantial bleeding in the papillary region prevented further instrumentation. One of these was successfully operated; the other died after one month because of acute haemorrhagic pancreatitis during a series of postoperative complications.

In the patients with common bile duct calculi

Table 2 Number of procedures required for endoscopic papillotomy (EPT) and removal of all stones in 42 patients with biliary calculi

<table>
<thead>
<tr>
<th>Patients (n)</th>
<th>Procedures in each patient (n)</th>
<th>Procedures (total n)</th>
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<tr>
<td>35</td>
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<td>35</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
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</tr>
<tr>
<td>1</td>
<td>5</td>
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ERC and EPT in patients with a previous Billroth-II

where endoscopic papillotomy was not attempted (n=15), two experienced substantial improvement in their condition while being prepared for surgery and were discharged untreated. No late complications were seen. In the remainder of the patients (n=13), traditional surgery was done and no serious postoperative complications were seen.

COMPLICATIONS
One patient died after a diagnostic ERCP because of a duodenal perforation and postoperative complications. One patient died a few days after the endoscopic papillotomy which initiated bleeding in the papillary region. One patient developed a reactive pancreatitis within a week after endoscopic

Fig. 8 Radiograph showing the papillotome (arrows) in correct position for cutting.

Fig. 9 A diathermy knife is used in order to perform a 'precut'.
Fig. 10 A closed dormia basket in correct position for suprapapillary fistulotomy.
Fig. 11 The papillotome is introduced through the fistula and is in correct position for opening and cutting.
papillotomy, but the condition improved after a few days. No serious complications were seen in the remaining patients.

Discussion

Reports on ERCP and endoscopic papillotomy in patients with a Billroth-II partial gastrectomy are few. Whether or not these methods are indicated in the treatment of such patients has been discussed.2,3,4 We have dealt with the problems of diagnosis1 and endoscopic papillotomy3 in such patients since 1974. After the period of novel techniques3 we feel that the methods described can be used in most patients, probably without danger of major complications.

The present experience is a result of close cooperation between a surgeon (RAR) and a physician (MO) during the past decade. During this period we have examined a large number of patients with Billroth-II resections. We have used the method with the 30–30-papillotomy and the fistulotomy. Most fistulotomies have been carried out at Ullevål Sykehus, and most papillotomies with the 30–30-papillotomy have been done at the Central Hospital of Akershus. We have recently used the 30–30-papillotomy with increasing frequency. From a technical point of view we feel that this method is simpler and appears less dangerous, as it is similar to the technique of conventional papillotomy in unoperated patients. Fistulotomy, however, may be favoured if there is an impaction of calculi in the ampulla of Vater with dilatation of the common bile duct, and visible protrusion of the duct. The finding that results from the two hospitals are similar, indicates that the methods might be useful in carrying out endoscopic papillotomy in most hospitals with experienced endoscopists. In experienced hands the procedure with endoscopic retrograde cholangiography and endoscopic papillotomy with extraction of all stones may be done in one session in most patients.

Patients who have undergone a partial gastrectomy some years previously appear to have a higher risk of developing biliary calculi than unoperated patients.5 These patients also have a higher risk of additional disease, such as chronic bronchitis, cardiovascular insufficiency, neoplasm and neurological disorders, than do unoperated patients,8 making them less suitable for conventional surgery. The success rate in these patients has been shown in previous papers1–6 to be considerably lower than in unoperated patients. For diagnostic purposes most of the diseases of the pancreas and bile duct may be diagnosed with a high degree of accuracy with modern non-invasive methods. Common bile duct calculi, especially in cholecystectomised patients, are, however, difficult to demonstrate with conventional methods.

Endoscopic retrograde cholangiopancreatography was successfully carried out in about 90% of the patients. Endoscopic papillotomy was also done in most of the patients. EPT should be attempted only when there are major contraindications for surgery. Patients with partial gastrectomy can be suitable candidates for ERCP and endoscopic papillotomy.

References

5 Osnes M, Rosseland AR. Fiberoptic endoscopy. Ullevål Hospital, Oslo, Norway: Scandinavian Association of Digestive Endoscopy (SADE).