Endoscopic Endoprosthesis Insertion in Unresectable Hilar Cholangiocarcinoma Patient

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ABSTRACT

Objective: Hilar cholangiocarcinoma is one of the most common causes of biliary tract obstruction in Thailand. However, in most patients, the tumors are unresectable. Endoscopic retrograde cholangiopancreatography (ERCP) with endoprosthesis insertion can provide effective internal biliary drainage in these patients; however, there are still some controversy regarding the complications, success rate and technical aspect of this approach. The aim of this study was to report results of palliative endoscopic endoprosthesis insertion using plastic stents in unresectable hilar cholangiocarcinoma.

Methods: We analyzed 72 sessions of ERCP with plastic stent insertion in 61 patients with unresectable hilar cholangiocarcinoma, treated at the Endoscopic Unit, Department of Surgery, Siriraj Hospital from 1999-2001. Statistical analysis were done using chi-square test.

Results: In 72 sessions of ERCP with plastic stent insertion, overall successful drainage was 48%. Early complication was found in 13 sessions (18%) with cholangitis 13.9%, pancreatitis 2.8%, bleeding 2.8% and intra-abdominal collection 2.8%. Unilateral stent insertion was done in 94% (right side 43.4%, left side 49.1%) and bilateral stent insertion was performed in 7.5%. The success rate of right duct stent insertion was 63.1% while that of left duct stent insertion was 36.4% ($p<0.01$). Mortality rate was 2.98%.

Conclusion: Endoscopic endoprosthesis insertion using plastic stent is an effective method for palliative biliary drainage in patients with unresectable hilar cholangiocarcinoma with acceptable morbidity and mortality rate.

Keywords: Hilar cholangiocarcinoma; ERCP; Endoprosthesis

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Cholangiocarcinoma is one of the most common causes of biliary tract obstruction in Thailand. The incidence is 89.2 : 100,000 in male and 35.5 : 100,000 in female.[1] Resectability rate in hilar cholangiocarcinoma varied between 50% and 97%.[2,3] In unresectable cases, the mean survival is about 8 months.[4] Palliative treatment for relief of symptoms such as pruritus, anorexia and cholangitis can improve quality of life in these patients. Surgical bypass, endoscopic endoprosthesis insertion and percutaneous transhepatic biliary drainage (PTBD) were considered for palliation. Surgical bypass provides good palliation but with high mortality rate (20-33%).[5,10] Non-operative biliary drainage provides as effective drainage as surgical bypass with lower complications and shorter hospital stay.[6] Endoscopic endoprosthesis insertion was preferred to PTBD because of less problem with electrolyte imbalance, volume deficit and infection.[7,8] Successful rate of endoscopic stent insertion was 89% and successful drainage was 80%.[9] Nevertheless, there are still controversies regarding the complications, success rate and technical aspect of this approach.

The aim of this study was to report results of palliative endoscopic endoprosthesis insertion in unresectable hilar cholangiocarcinoma.

MATERIALS AND METHODS

A retrospective study of 79 sessions of ERCP and plastic biliary stent insertion in patients with unresectable hilar cholangiocarcinoma who attended the Endoscopic Unit, Department of Surgery, Siriraj Hospital during in 1999 - 2001 was done. All patients had hilar cholangiocarcinoma and were considered unsuitable candidates for surgical resection based on general medical condition and tumor extent.

Before ERCP procedure, prophylactic treatment with broad-spectrum antibiotics was initiated. During cholangiography, hilar stenotic site was identified using minimal

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Fig 1. Unilateral cholangiography after successful placement of guide wire through the malignant stricture

amount of contrast agent, limiting to only extrahepatic bile duct distal to the tumor. Then, sphincterotomy was performed and guide wire was advanced through the malignant stenosis into the duct where it was technically easiest to access. Only then that the catheter was passed through the stricture and cholangiogram of the proximal bile duct was done to complete unilateral cholangiogram (Fig 1). Finally, a plastic stent (10Fr) was placed over the guide wire. A successful stent placement was defined as a passage of stent across the stricture with good run-off of contrast media and bile.

The data were collected from ERCP reports, inpatient summary charts, outpatient records and telephone interviews with patients who did not attend the follow-up clinic. We recorded age, sex, presenting symptoms, imaging study finding, stent characteristics, successful stent insertion, successful drainage, early complications, mortality in data collecting chart. Regarding the stent characteristics, we recorded the size, number and location of stent placement. Successful drainage was defined as falling of bilirubin level greater than 30% in two weeks after stent insertion or improvement of symptoms and jaundice in patients who bilirubin level was not obtained in follow-up time. Ascending cholangitis, pancreatitis, perforation, bleeding in one week after the procedure were defined as early complications. Mortality was defined as death within two weeks after stent insertion. Chi-square test was used for comparison of proportions. All statistical analyses were performed with the SPSS 10.0 statistical software program. P value of <0.05 was considered statistically significant.

RESULTS

There were 79 sessions taken in 67 patients with unresectable hilar cholangiocarcinoma. Males were more common. Their age ranged from 30-85 years with mean age of 55. All patients presented with jaundice (100%) while some patients had abdominal pain (60%) and cholangitis (19%). Pre-treatment mean of total bilirubin was 17.86 mg/dl compared with 9.31 mg/dl after treatment. Mean reduction of bilirubin was 52%. Basic clinical data were shown in table 1.

ERCP with stent insertion was attempted in 79 sessions in 67 patients. Successful stent insertion was achieved in 72 sessions (91.1%). In unsuccessful stent insertion group (8.9%), 1 patient developed duodenal perforation.

In 72 sessions of successful stent insertion, rate of successful drainage, early complications, characteristics of stents, and mortality rate were analyzed (Table 2).

TABLE 1. Baseline clinical data

Patients (n)	67
Sessions	79
Gender (M/F)	48/25
Mean age (range)	55 (30-85)
Symptoms	
Jaundice	67 (100%)
Abdominal pain	40 (60%)
Abdominal mass	3 (0.05%)
Cholangitis	13 (19%)
Total bilirubin before stent	17.86 ± 11.08 mg/dl
Total bilirubin after stent	9.31 ± 7.22 mg/dl

Successful drainage could be analyzed in 58 sessions. We found that successful drainage was obtained in 28 sessions (48%). Overall early complications occurred in 13 sessions (18%). The most common complication was ascending cholangitis which occurred in 10 out of 72 sessions (13.9%). Pancreatitis occurred in two sessions (2.8%) and improved with conservative treatment. Bleeding occurred in two sessions (2.8%) and hemostasis by adrenalin injection was performed in one patient and electric coagulation in another patient. One patient developed intra abdominal collection.

Regarding stent characteristics, in most of the patients, single stent was placed (94.5%). We have data about location of stent insertion in 53 sessions. The stent was placed in right duct in 23 sessions (43.5%) and 26 sessions (49.0%) in left duct. Bilateral stent insertion was performed in 4 sessions (7.5%).

Successful drainage in right-duct insertion was 63.1% (12/19), and 36.4% (8/22) in left-duct insertion. Higher rate of successful drainage could be obtained in right-duct insertion with statistical significance ($p<0.01$) (Table 3). In bilateral stent insertion successful drainage was achieved in 3/3 sessions without any early complication.

The patency of the stents ranges from 1-35 weeks with mean patency of 9.6 weeks.

Death within two weeks occurred in two patients with mortality of 2.98%. The cause of the deaths was septic shock due to ascending cholangitis.

DISCUSSION

Endoscopic endoprosthesis insertion has assumed an increasingly important role in palliation of patients with unresectable hilar cholangiocarcinoma because of its efficacy, patient acceptance, low cost (compared to surgery), and relatively low morbidity and mortality rates.[11] Hilar lesions pose particular difficulties for plastic stent placement as it produces a higher rate of cholangitis. In recent years, expandable metallic stents have overcome these complications. However, due to their higher cost, in many occasions, endoscopists still have to rely on plastic stent insertion for biliary drainage.

In some reports, the rate of cholangitis associated with plastic stent insertion in hilar cholangiocarcinoma was as high as 53%.[12] In this study, however, cholangitis was found in only 13.9% of the sessions. Meticulous injection of contrast media, insertion of only one stent to minimize the duration of the procedure and usage of antibiotics may contribute to the lower rate of cholangitis. However, successful drainage of only 48% was also low when compared to other studies.[13] This may reflect the

TABLE 2. Data shows rate of successful insertion, successful drainage and early complications

	Session	Percentage
Successful insertion	72/79	91.1%
Successful drainage	28/58	48%
Unsuccessful drainage	30/58	52%
Early complication	13/72	18%
Ascending cholangitis	10/72	13.9%
Pancreatitis	2/72	2.8%
Bleeding	2/72	2.8%
Abdominal collection	1/72	1.4%

fact that this study recruited only advanced cases of hilar obstruction, allowing the drainage to cover only some portion of the liver. Higher rate of successful drainage could be achieved if multiple stents were employed but with sacrifice of higher rate of cholangitis. Since patients with advanced hilar cholangiocarcinoma are already in poor nutritional status, complications such as cholangitis can be fatal.

Unilateral stent insertion (one stent) or bilateral-stent insertion (two or more stents) is another area of controversy. The concerns regarding one stent include the inability to relieve jaundice and potential cholangitis of the undrained segment, especially when the contrast is injected. Drainage of at least 25% of the liver volume is needed to achieve effective biliary drainage and relief of the symptoms. Endoscopic plastic stent insertion employed in this study was based on the principle that unilateral stent placement is sufficient.[9] On the contrary, Chang suggested that bilateral-stent placement provided a better chance to prolong the survival.[14] One or two stents may not be an important issue when the care not to inject contrast media into undrained segment is given to the patients.

Approximately 60% of the liver volume is drained via the right hepatic duct, 30% by the left hepatic duct, and the caudate lobe accounts for 10%.[15] The mean length of the right hepatic duct is 0.9 cm with early division into secondary branches, while the left hepatic duct has a longer course of 3 to 3.5 cm before dividing up into smaller branches. From this fact, it could be easily assumed that hilar cholangiocarcinoma has the tendency to invade the secondary divisions of the right hepatic duct earlier than the left duct. Hence, it should be preferential to drain the left side when possible. However, this was not the case in this study, better drainage could be achieved from the right side drainage (63%) compared to the left side drainage (36%) ($p<0.01$). This finding contradicts the result of Polydorou et al.[16] which showed no difference between the right side and left side stent insertion. Thus, from this study, right side drainage should be done whenever the technique is feasible.

Plastic stent insertion in hilar cholangiocarcinoma was associated with high rate of occlusion (27%-50%) and stent exchange is required in up to 42% of patients.[17] The mean stent patency in this study was 9 weeks. Studies showed that plastic stent replacement should be done at 4 to 6 months interval.[18] Our results, however, showed a shorter period of patency compared to other studies. This may be because longer stents were needed in hilar strictures to make it easier to clog and migrate.

A study[19] has been done in an attempt to assess the intrahepatic duct for higher rate of effective drainage using such modality as magnetic resonance cholangiopancreatography (MRCP). Its usefulness still has to be determined after more studies. Obviously, to achieve successful drainage with low rate of cholangitis and longer patency, one has to take into account the anatomy of the hepatic duct and the volume of the liver to be drained without having to inject contrast media.

TABLE 3. Successful drainage in right duct insertion compared to left duct

	Right duct insertion	Left duct insertion	Bilateral insertion
Location of stent	23/52 (43.5%)	26/52 (49%)	4/52 (7.5%)
Successful drainage	12/19 (63.1%)	8/22 (36.4%)	3/3 (100%)

The mortality rate of plastic stent insertion in our study was 3% which was low. Considered together with acceptable rate of successful drainage, we thought that if carefully performed, ERCP with plastic stent insertion is still a useful option for palliative biliary drainage in patients with unresectable hilar cholangiocarcinoma.

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บทคัดย่อ

ผลการรักษาผู้ป่วยมะเร็งท่อน้ำดีด้วยการใส่ท่อระบายน้ำดีชนิดพลาสติกผ่านกล้อง

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มะเร็งท่อน้ำดีพบได้มากในประเทศไทย ผู้ป่วยส่วนใหญ่ไม่สามารถทำการผ่าตัดได้ ทำให้การระบายน้ำดีที่อุดตันมีความสำคัญในการรักษาผู้ป่วยเหล่านี้ การใส่ท่อระบายผ่านกล้องเป็นการระบายน้ำดีที่ดีวิธีหนึ่ง แต่เป็นหัตถการที่มีผลแทรกซ้อนและชนิดของท่อระบายยังเป็นปัญหาที่ถกเถียงอยู่ การศึกษาได้ทำการวิเคราะห์ผลการใส่ท่อระบายน้ำดีชนิดพลาสติกผ่านทางกล้อง ระหว่างปี คศ. 1999-2001 พบว่ามีการใส่ท่อระบาย 72 ครั้ง ในผู้ป่วย 61 คน ที่ภาควิชาศัลยศาสตร์ จากการวิเคราะห์พบว่าการใส่ท่อระบายวิธีนี้สามารถระบายน้ำดีได้เป็นผลสำเร็จ 48%, พบผลแทรกซ้อน 18% โดยมีอัตราตายเพียง 2.98% สามารถทำการใส่เข้าท่อน้ำดีข้างขวาได้มากกว่าข้างซ้าย จากการศึกษานี้สามารถสรุปได้ว่าการใส่ท่อระบายชนิดพลาสติกผ่านกล้องเป็นหัตถการที่มีประโยชน์กับผู้ป่วย