

Bile duct reconstruction after iatrogenic injury in the elderly

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Abstract

Bile duct injuries occur with a frequency of 1 to 5 per 1000 cases as a result of an increase in the number of procedures performed. Elderly patients have more severe lithiasis-related diseases than the younger population. This fact increases the likelihood of conversion from laparoscopic to open surgery, and the probability of injury. We report the results of bile duct reconstruction after injury in these patients. *Setting:* A tertiary care academic university hospital. *Methods:* The files of patients over 65 years of age who had biliary tract reconstruction after iatrogenic injury were retrospectively reviewed. Post operative results, quality of life and failures from the repair were analyzed. *Results:* 20 patients over the age of 65 were referred for biliary tract reconstructive surgery over a ten year period. Mean age was 71 (65 – 83). Nineteen cases were referred from other hospitals. Fourteen cases (60%) had comorbidities (type 2 diabetes mellitus, systemic hypertension). All patients were treated by means of Roux en Y hepatojejunostomy. No operative morbidity was recorded and only one major complication (abdominal collection) was found. Two long term mortalities unrelated to surgery were found. Treatment success (as defined by the Johns Hopkins criteria) was obtained in 17 cases (85%) and only one patient (5%) required reoperation two years after the initial attempt. *Conclusions:* Elderly patients that survive biliary injury and are reconstructed have long-term results comparable to the younger population; Roux en Y hepatojejunostomy offers the best surgical choice.

Key words: Cholecystectomy, bile duct, injury, elderly.

Introduction

There is an ever increasing elderly population that is fit and healthy. Since gallstones increase with age, cholecystectomy has become a common operation in elderly patients,¹ thus indirectly increasing bile duct injuries. Surgically-related complications include increased respiratory and cardiovascular morbidity.² Laparoscopic surgery may be particularly advantageous in this population,³ although laparoscopic cholecystectomy has a higher frequency of bile duct lesions (3 to 6 in 1000 cases) than an open approach.⁴

Considerable controversy exists about the need for treatment of asymptomatic gallstones in elderly patients and the current tendency indicates an expectant behavior similar to that in a younger population. This results in a considerable number of elderly patients being cholecystectomized because of cholelithiasis complications. Gallstone disease in the elderly is more severe than in the younger population.⁵

Several variables may be associated with adverse outcome following bile duct repair, including the severity of the injury, associated vascular injury and comorbid conditions.

We describe our experience with biliary reconstruction in elderly patients.

Methods

The files of patients over 65 years of age who had biliary tract reconstruction after iatrogenic injury were retrospectively reviewed. Only complex injuries were included in the analysis and patients with injuries that were treated by means of endoscopy and/or radiologic approaches were not included. Patients that required a bilioenteric anastomosis were surgically treated. These patients had either common bile duct or common hepatic duct injuries. Bile leaks from the gallbladder bed and cystic ducts were excluded as were other types of strictures not related to a surgical injury.

Patients referred from outside hospitals were fully evaluated with ultrasound and liver function tests.

Surgical reconstruction was generally performed as an elective procedure. The anatomic conditions of the biliary tree were evaluated by percutaneous cholangiography in

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the first years and recently by cholangio resonance.

Surgical management In all cases consisted of a Roux en Y hepatojejunostomy. The proximal hepatic duct was identified and dissected caudocephally, without mobilizing the lateral aspects of the duct in order to preserve its vasculature. Dissection was done only in the anterior aspect, descending the hilus by means of cutting the hilar plate and partially removing segment IV and V in order to obtain complete exposure of the confluence.^{6,7} The anterior longitudinal section of the duct was guided by small biliary dilators, directing the longitudinal section to the left duct in order to obtain a larger segment for the Hepp – Couinaud type anastomosis.⁸ A Roux en Y jejunal limb (average 40 cm long) was prepared for the bilio enteric anastomosis. The anastomosis was performed as an end – side to side hepatojejunostomy using interrupted absorbable monofilament sutures with everted knots. A transhepatic transanastomotic stent was used in certain cases where the ducts were scarred or inflamed in the event post operative late radiological instrumentation through the stent path was required.

The length of follow up was calculated from the date of definitive surgical repair. Johns Hopkins criteria for evaluation of reconstruction (excellent: no symptoms attributable to the biliary tract injury or reconstruction; good: mild symptoms not requiring invasive investigation or treatment; treatment failure: ongoing symptoms or stricture recurrence that require invasive diagnostic or therapeutic procedures, either radiological or surgical.⁹

Results

A total of 180 patients were surgically reconstructed at our Institution after bile duct injury during a 10 year period (1993 – 2003). Of these, twenty were over 65 years of age. Mean age was 71 years (range 65 – 83). Seventeen were female. Comorbidities were documented in fourteen patients (*Table I*) systemic hypertension 6; type 2 Diabetes Mellitus 4; obstructive lung disease 2; systemic sclerosis 1, hypothyroidism 1.

All patients except one were referred from other institutions. In twelve patients the injury resulted from an open procedure and in 8 from laparoscopic surgery. Nineteen patients had history of a previous attempt at reconstruction. In all cases a Roux en Y hepatojejunostomy was done and in 3 cases a transhepatic transanastomotic stent was used.

No operative mortality was recorded. Mean hospital

stay was 8 days (range 6 – 10). One patient developed a postoperative abdominal collection that was percutaneously drained. Mean follow up was 24 months (range 5 to 53 months). Two long term mortalities were recorded: an 81 year-old patient had a myocardial infarction 5 months after reconstruction and an 83 year-old patient developed pneumonia 13 months post reconstruction.

Excluding the two deaths, treatment success (excellent or good results) was obtained in 17 cases. Only one case had recurrent cholangitis that required a reoperation two years after the initial reconstruction attempt. In the second operation, a transhepatic – transanastomotic stent was placed. Liver function tests did not return to normal values. She was lost for follow up one year ago.

Discussion

Treatment goal in elderly patients is to restore them to the best possible quality of life. Gallstones are more commonly found in elderly patients and complications of cholecystitis are frequent and exaggerated, with a greater prevalence of emphysema, gangrene and gallbladder perforation.¹⁰ Choledocolithiasis and its complications, jaundice, cholangitis and pancreatitis,¹¹ occurs often. Consequently, emergency procedures are frequently required in the elderly.

Open cholecystectomy in the elderly is associated with considerable morbidity and mortality, with complication rates reported in the range of 18% to 35% and mortality as high as 12.7%. Most of the morbidity of open cholecystectomy probably relates to the large abdominal incision. Thus, the laparoscopic approach should result in decreased morbidity in older patients.^{12,13} This probability has also increased the expansion of the indication of the procedure in the older patients and because the frequency of bile duct injury remains constant, the number of elderly patients with bile duct injury has grown. Most authors recommend attempting laparoscopic cholecystectomy in elderly patients with acute cholecystitis but advise maintaining a low threshold for conversion to an open procedure.^{14,15}

Mortality rates for emergency cholecystectomy ranges from 5 to 19% in the elderly compared to less than 3% in elective procedures.¹⁶ The decision to treat an elderly patient with either asymptomatic or symptomatic stones must be based on individual factors. There is currently no justification for prophylactic cholecystectomy in the elderly patient with truly asymptomatic gallstones.

Bile duct injury is a major risk of cholecystectomy (including acute disease) with a constant frequency (1 to 5 per 1000 cases) even in the most experienced hands. Conversion from laparoscopy to an open procedure has been described more frequently in the elderly population (related to severity of disease that makes the laparoscopic approach less suitable), although this is unrelated to a higher frequency of bile duct lesions. The frequency of lesions of the bile duct in the elderly patients is complete-

Table I.

Systemic hypertension	6
Type 2 Diabetes Mellitus	4
Obstructive lung disease	2
Systemic sclerosis	1
Hypothyroidism	1

ly comparable to that of the younger population.¹⁷

Elderly patients comprise about 10% of our total bile duct reconstructed population. The type of injuries and the results of reconstruction are fully comparable to those of the younger population. In our experience we had no operative mortality, a low and comparable complication rate as well as long term favorable results.

Unlike other diseases (for example gastroesophageal reflux) where effective therapeutic alternatives are available, there are no alternate choices when a complex biliary injury has occurred. Surgery is mandatory if loss of continuity of the biliary tree makes endoscopic or radiological therapy unavailable.

Our results show that biliary tract reconstruction is well tolerated in the elderly patients.

Usually an elderly patient candidate for elective surgery is in good general condition and will tolerate the reconstruction, however this will obviously depend on each patient's individual history, and some will not tolerate a large and demanding procedure. There are obvious variants of the physical status among elderly patients, and it is possible, for example to find a 65 year- old patient with many comorbidities and an 80 year- old patient with no comorbidities and excellent cardiopulmonary status. An injury of the bile duct with systemic reperfusion in the first patient could make him non- eligible for biliary reconstruction. On the other hand, the latter patient could probably tolerate well both the injury and the repair attempt.

Although the same is true for the younger population, the elderly subset have a higher probability of failure. Nevertheless, all patients referred to our institution for repair were in good condition for the operation.

The operation of choice is a Roux en Y hepatojejunostomy, high in the hilus. We have stressed that an anastomosis done at the confluence level warrants absence of ischemic damage of the ducts obtaining a successful anastomosis.¹⁸

These patients benefit from being repaired by experienced surgeons interested in biliary reconstruction, that have a higher chance of success of repair.^{19,20} Several authors have demonstrated that the outcome of patients with biliary injuries is better when experienced surgeons do the repair. In our experience, two thirds of the patients referred to our institution had a failed attempt of reconstruction in the previous weeks or months. This issue is relevant in the elderly patient population referred to our hospital, in which 19 of the 20 cases had had a previous attempt of reconstruction. The patients were otherwise in good physical conditions and a new attempt of reconstruction, successful in 95%, was performed. It is probable that the type of population referred for repair was a self-selected physical subset of patients. An unknown number of patients (probably large) are not referred for definitive repair because of poor clinical condition.

The elderly are the fastest growing segment of the population in both developed and developing countries, thus

the need for surgical treatment of some diseases is also growing. Cholecystectomy is the most common abdominal operation done in this subset of patients. Many of the patients older than 65 are nowadays healthier and more fit. Most of the patients with complex injuries are only candidates for surgical treatment, with no other therapeutic choice, and the risks of reconstruction have to be confronted. When the patient is in good physical condition, the results of reconstruction are totally comparable to that of younger patients with excellent results in most of the cases.

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