Surgical treatment of acute cholecystitis in the early stage of the disease was first advocated by Walton in 1923. Acute cholecystitis is usually treated conservatively in Great Britain, operation being reserved for cases where the diagnosis is uncertain, or where the inflammatory process is progressing. The majority of cases treated conservatively will settle down, but it must be remembered that during the period of conservative treatment it may become necessary to operate.

The purpose of this study is to review cases of acute cholecystitis treated by early operation during a 10-year period at Salford Royal Hospital.

Between 1955 and 1965, fifty-five patients with acute cholecystitis were operated on in the acute phase of the disease. This does not necessarily mean they had an operation on the day of admission, but were often added to the first operating list following their admission to hospital, provided there were no contra-indications to delayed operation, such as perforation of the gallbladder (Fig. 1).

The diagnosis of acute cholecystitis was made clinically, or at laparotomy, and confirmed, in all except eight cases, by histology of the gallbladder.

**Age and sex incidence**

Of the fifty-five cases, seven were aged over 70 years (the oldest being 84), and twenty were over 60 years old.

Females constituted 69% of the patients.

**Operation**

Cholecystectomy was performed in all except two cases. In these two, cholecystostomy was performed because it was considered that cholecystectomy would endanger the common bile duct.

Cholecystostomy was performed together with cholecystectomy in nine cases (Table 1).

<table>
<thead>
<tr>
<th>Operative procedure</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholecystectomy</td>
<td>44</td>
<td>80</td>
</tr>
<tr>
<td>Cholecystectomy and cholecystotomy</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>Stones found</td>
<td>5 (55%)</td>
<td></td>
</tr>
<tr>
<td>Cholecystostomy</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

**Complications (Table 2)**

**Wound infection**: nine cases (16%)

In each of these patients the infection prolonged their stay in hospital to an average of 20 days, compared with an average of 14 days in patients who had no complications (Fig. 2).

**Wound dehiscence** occurred in one case following wound infection.

**Pulmonary emboli**: Two cases, one being fatal.

**Deaths**: Three cases, that is a mortality rate of 5.5%. These three cases will be discussed in more detail.

(1) Male of 84 years who had a cholecystectomy on the day of admission. This was followed
by wound infection and wound dehiscence on the 10th post-operative day. Following the re-suture of his wound he developed retention of urine and a severe urinary infection. He made little progress and never became ambulant. He died on the 22nd post-operative day.

At post-mortem examination the cause of death was found to be a pulmonary embolus.

(2) Female of 75 years whose pain started 5 days before admission to hospital. On admission she had a palpable mass in the right hypochondrium and signs of peritonitis.

At operation the same day she was found to have a perforated gallbladder with an abscess around it. A cholecystostomy was performed. This drained satisfactorily for the first 6 days, but she developed a wound infection with a swinging pyrexia. She gradually deteriorated and died from toxaemia on the 30th post-operative day.

(3) Female of 61 years, who was admitted to hospital 3 days after the onset of pain. The pain was in the epigastrium and right hypochondrium for the first 2 days, but on the day of admission she developed generalized abdominal pain. On examination she had signs of peritonitis. Laparotomy performed the same day revealed a perforated gallbladder.

Cholecystectomy was performed. Following operation she had a period of hypotension, but in spite of recovering from this she died on the 3rd post-operative day from renal failure. At post-mortem she was found to have chronic pyelonephritis. The period of hypotension in the presence of impaired renal function presumably precipitated renal failure.

**Bile duct injuries.** There were no cases in this series.

**Follow-up**

The follow-up ranges from 10 years for some patients to 1 year for others, the majority falling between these two extremes.

Four patients could not be traced and two patients have since died from unrelated causes. The follow-up on these two cases being 4 and 7 years respectively, there is, therefore, a 93% follow-up. The remaining forty-nine patients have had no symptoms referable to their biliary tract, have never been jaundiced and have had no further surgery performed.

It may be added that the surviving patient who had a cholecystostomy has never had a cholecystectomy, refusing the offer of this as he has remained completely symptom free.

**Discussion**

Surgical treatment of acute cholecystitis in the early stage of the disease consists of either cholecystectomy or cholecystostomy, the choice depending on the state of the gallbladder and bile ducts, and also on the experience of the surgeon. Common bile duct injuries can be minimized by the correct selection of the surgical procedure to be carried out. There is no contra-indication to exploring the common bile duct if the anatomy can be easily displayed. The indications for exploring the common bile duct in acute cholecystitis are the same as in chronic cholecystitis, namely jaundice, dilatation and thickening of the common bile duct, or a palpable stone in the common bile duct.

In this series nine patients (16%), had a choledochotomy and five of these (55%), had one or more calculi in the common bile duct. These figures are very similar to those of Glenn & Thorbjarnarson (1963) who explored the common bile duct in 12% of their cases of acute cholecystitis and found stones in 59%. They compared this with their cases of chronic cholecystitis where 14% had a choledochotomy and of these 64% had stones.

From this series it would appear that damage to the common bile duct is uncommon. The conservative school suggest that there is less risk of surgical accident if cholecystectomy is delayed for 3 months after the acute attack, for the ducts are more easily displayed at this stage. But as Smith (1964) points out, a severe attack of acute cholecystitis involving the tissues outside the gallbladder results in the formation of an inflammatory mass which slowly resolves. If cholecystectomy is therefore delayed for 3 months, dense scar tissue will have formed between Hartmann's pouch and the common bile duct, rendering exposure of the ducts far from easy.

In this series the average stay in hospital post-operatively for patients with no complications was 14 days, which is similar to the post-operative stay following elective cholecystectomy. The great advantage to the patient in operating in the acute
stage is that they require only one hospital admission.

The mortality rate in this series (5.5%) is higher than for interval cholecystectomy. Maingot (1964) reports his mortality rate following cholecystectomy alone for calculous cholecystitis as 0.6%, but adds that the mortality rate shows a sharp rise in the aged, feeble and jaundiced patients.

McEachern & Sullivan (1959) reported 155 patients who had emergency cholecystectomy for acute cholecystitis. Their mortality rate was 5.8%, and all those who died were over 50 years old; five of the nine patients who died had perforated gallbladders.

In this series the three patients who died were over 60 years old and two of them had biliary peritonitis secondary to perforated gallbladders. Biliary peritonitis is associated with a mortality of between 50% and 75% according to Ellis & Cronin (1960) and Bell & Warden (1955). The two patients in this series with biliary peritonitis would have required urgent laparotomy even if they had been under the care of a surgeon who treated acute cholecystitis conservatively.

If surgery is performed in the early stage of acute cholecystitis, the incidence of perforation and gangrene of the gallbladder will be prevented in a number of cases. These two complications are much more common in the older age group. In a series published by Jones et al. (1960), 71% of the perforations and gangrene of the gallbladder were in patients over 50 years of age.

Conclusion
The supporters of the conservative management of acute cholecystitis argue that damage to the bile ducts and hepatic artery are likely to occur if early surgery is undertaken. In this series it is shown that this is not so, provided the surgeon is experienced and the correct surgical procedure is carried out.

Recurrence of biliary tract symptoms is rare and stones remaining in the common bile duct are not a problem following operation for acute cholecystitis.

Two admissions to hospital are prevented by operating in the acute phase. The stay in hospital post-operatively is comparable with the stay following elective cholecystectomy. Surgery in the acute phase will often prevent gangrene and perforation of the gallbladder, which carry a considerable mortality. Since these two complications are more common in the elderly, early cholecystectomy is particularly indicated in these patients.

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