The influence of percutaneous cholecystostomy on the prognosis

of patients with acute cholecystitis.

Introduction

Acute cholecystitis (AC) is a common cause of surgical admissions. Patients prognosis is usually good while 75% of patients will improve under conservative treatment. However 25% of patients are prone to complication despite conservative treatment that includes empyema of gallbladder, gangrenous cholecystitis, gallbladder perforation, gallstone ileus etc.

The gold standard therapy in the 21th century is "laparoscopic cholecystectomy" in the first operating day in depending on disease severity and patients' comorbidities. However there are some treatment policies included late cholecystectomies, percutaneous cholecystostomy (PC) as a bridging or definitive treatment.

Treatment is based first on stabilization of the patients, fluids, antibiotic therapy, NPO electrolytes balance and analgesics.

Patients, those who are fit for surgery, usually being operated at the 1st operating day if the timing of the inflammation process is less than 3 days [3]. This method proved to be safe with shortened hospital stay and no increased in complication rate [4,5,6]. However, elderly patients , high risk patients- with comorbidities or admitted patients with failure of conservative treatment or hemodynamically unstable are referred to PC. The insertion of PC usually served as a bridging therapy although in some cases as a definitive therapy especially in very high risk patients.

The aim of this study was to determine the consequences of PC in patients with AC in comparison to patients with AC that did not performed PC with regard to: hospitalization period, 30 days and 1 year mortality and recurrent admissions.

**Materials and methods**

A retrospective case study approved by the local IRB. Inclusion criteria were all patients admitted to the surgical departments in Wolfson medical center between 2008 to 2014 with the diagnosis of AC. Patients that were operated upon during the primary admission or patients that were first admitted with AC before 2008 were excluded from our study. Patients were divided into two groups according to insertion of PC or none. Data was collected including demographic features severity score of AC, ASA score, comorbidities, laboratory tests, hospitalization period, Cholecystectomy date, recurrent admissions, recurrent admission with AC (in the relevant cases ) and mortality, in patients with PC. Drain complication reports were also recorded including self-extraction or sepsis.

Percutaneous Cholecystostomy was performed by interventional radiologist. All procedures were performed in the invasive radiology unit under local anesthesia and monitoring. An ultrasound guided transhepatic approach was used in all patients. A 19G sheathed needle was inserted using the Seldinger technique and a pigtail drainage catheter was inserted after proper dilatation. The gallbladder content was aspirated and send for culture and the catheter was secured to the skin. The PC was left intact until cesasion of septic episode. In cases of future planned Laparoscopic cholecystecvtomy the catheter was clamped and removed during operation after demonstration of cystic duct patency on cholangiography. In cases of high risk patients the PC was left open connected to a bag.

Results

During the research period 683 patients were admitted with the diagnosis of Acute Cholecystitis, of which 69 pts (10%) needed more than one admission during the research period thought 764 patients were included. Demographic characteristics are presented in Table 1. Average age was 62 years while 336 pts (49.1%) were above 65 years of age. There was a female predominance 54% v 45% man. Patients were equally admitted to the two surgical wards.

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| **Table 1**: Patient Demographics |
| Age (years) | 62.0+19.3 |
| Sex |  |
|  | males | 312 (45.7%) |
|  | Females | 371 (54.3%) |
| Marital status |  |
|  | Single | 66 (9.7%) |
|  | Married | 390 (57.1%) |
|  | Divorced | 97 (14.2%) |
|  | Widowed | 116 (17.0%) |
| Department of admission |  |
|  | Surgery "A" | 348 (51.0%) |
|  | Surgery "B" | 335 (49.0%) |

Table 2 presents patients co morbidities, ASA score, disease severity score and laboratory values. The average ASA score was 2.12 while 62.5% of patients had ASA score of 1-2 and only 2.8% had ASA score of 4-5. Disease severity score was mild to moderate in 94.3% of the patients. NIDDM was the common comorbidity followed by I.H.D and C.O.P.D.

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| **Table 2**: Disease parameters, co-morbidities and laboratory values of study cohort |
| Disease severity |  |
|  | Mild | 439 (64.3%) |
|  | Moderate | 205 (30.0%) |
|  | Severe | 39 (5.7%) |
| Average ASA score | 2.12+0.87 |
| Co-morbidities  |  |
|  | Diabetes mellitus | 30.2% |
|  | Ischemic heart disease | 20.6% |
|  | COPD | 10.8% |
|  | Renal failure | 7.3% |
|  | Obesity | 7.3% |
|  | Biliary calculus | 4.8% |
|  | CVA | 1.6% |
|  | Cholecystostome | 7.3% |
|  | Cholecystectomy\* | 41.6% |
| Laboratory values |  |
|  | Hemoglobin (g/dL) | 13.3+1.7 |
|  | WBC (cells per cmm3) | 12.7+4.8 |
|  | Creatinine (mg/dL) | 0.93+0.56 |
|  | Total bilirubin (mg/dL | 1.26+1.30 |
|  | ALP (IU/dL) | 110+101 |
|  | \* -Number of patients undergoing elective cholecystectomy at the Wolfson Medical Center following the admission.  |

Patients were divided into two groups depending Cholecystostom insertion. Tables 3 and 4 represents demographic characteristics and laboratory results of the two groups. Patients with PC were much older while 84% of them were in the geriatric population (age< 65 years). There was no statistical significant diffirence in comparing comorbidities between the two groups althogh the incidence of CVA was more common in the PC group.

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| **Table 3**: Comparison of patient demographic data and co-morbidities across Cholecystostom placement status |
|  | Non=633 | Yesn=50 | p Value |
| **Age (years)** | **60.8±19.2** | **76.0±12.4** | **<0.001** |
| **Age 65 and over (%)** | **46.4** | **84.0** | **<0.001** |
| Female sex (%) | 55.1 | 44.0 | 0.128 |
| Diabetes mellitus (%) | 29.5 | 36.7 | 0.414 |
| Renal failure (%) | 7.0 | 10.0 | 0.550 |
| Obesity (%) | 6.7 | 13.3 | 0.182 |
| IHD (%) | 19.3 | 33.3 | 0.071 |
| Biliary calculus (%) | 5.3 | 0 | 0.198 |
| **CVA** (%) | **1.1** | **6.7** | **0.019** |
| Cholangitis (%) | 0.7 | 0 | 0.645 |
| Cholecystectomy (%) | 41.4 | 44.0 | 0.719 |

Laboratory tests demonstrated abnormal finding in the PC group. Patients with PC were anemic, with higher leukocytes count higher urea and creatinine levels and lower albumin and sodium levels.

Disease severity score and ASA scores were significantly worse in the PC group (figure 3 & 4 ).

**Figure 3**: Distribution of ASA score across cholecystostom status groups

**Figure 4**: Disease severity across cholecystostom status groups

Discussion

The use of percutaneous cholecystostomy is still common practice in special populations although the literature is floated with reports on laparoscopic cholecystectomy even in the acute phase, However the outcome of patients with cholecystostom is intersting.