

Clinical Research

The Performance of Percutaneous Cholecystostomy in Geriatric Patients with Acute Cholecystitis Accompanying Serious Comorbidities

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ABSTRACT

Objective: A percutaneous cholecystostomy (PC) may be listed among the treatment options for cases of acute cholecystitis (AC) in geriatric patients with accompanying comorbidities. We report on geriatric patients with high rates of comorbidities and AC who underwent a successful PC treatment and received follow-up care.

Material and Method: Patients who were diagnosed with AC, were over the age of 65 and underwent a PC because of operative comorbidities between November 2011 and October 2014 were examined retrospectively. Patients' age, gender, cholecystostomy indications, accompanying diseases, duration of stay in hospital, duration of follow-up, amount of drainage after the procedure, culture results, success of the procedure, complications related to the procedure and records of the surgical and medical treatments after PC were recorded.

Results: A total of 22 patients who received a PC were enrolled in the study and retrospectively investigated using database information, patient files and operative notes. Nine of the patients were female, 13 were male and the mean age was 76.5 years. The mean follow-up period was 28.2 months; the length of hospital stay was 7 (2-12) days; and the mean duration of drain was 31.2 (29.2-36.2) days. Definitive treatment was performed on 4 (18%) of the patients, while in 18 (82%) of the patients, catheter was removed without any additional procedures.

Conclusion: The use of PC has increased since it was first described by Radder in 1980. In geriatric patients with high cardiac and pulmonary morbidity, a PC is often used for treatment. As a low cost, quickly effective, time-saving treatment method with low complication rates, PCs can be used as a temporary or definitive treatment method for cases of AC in high risk geriatric patients.

Keywords: Acute Cholecystitis, Geriatric Patients, Percutaneous Cholecystostomy, Cholecystectomy.

ÖZET

Ciddi Komorbiditesi olan Geriyatrik Akut Kolesistitli Hastalarda Perkütan Kolesistostominin Performansı

Amaç: Perkütan kolesistostomi (PK) yaşlı ve komorbiditesi yüksek akut kolesistitli (AK) hastalarda tedavi seçenekleri arasındadır. Ciddi komorbiditesi olan geriyatrik akut kolesistitli hastalarda PK'nin başarılı tedavi ve takibini sunmayı planladık.

Gereç ve Yöntem: 2011 Kasım ve 2014 Ekim arasında, 65 yaş üstü ve PK yapılan akut kolesistitli hastalar retrospektif olarak incelendi. Hastaların yaş, cinsiyet, kolesistostomi endikasyonu, eşlik eden hastalık, hastanede kalış süresi, takip süresi, işlem sonrası drenaj miktarı, kültür sonuçları, başarı oranı, işleme bağlı komplikasyonlar ve PK sonrası yapılan medikal ve cerrahi tedaviler kaydedildi.

Bulgular: Toplam 22 PK yapılan hasta çalışmaya dahil edildi ve çalışma hastane veri tabanı, hasta dosyaları ve ameliyat notları incelenerek retrospektif olarak yapıldı. Hastaların 9'u bayan, 13'ü erkekti ve ortalama yaş 76.5 yıldı. Ortalama takip süresi 28.2 ay, ortalama hastanede kalış süresi 7 gün (2-12) ve ortalama dren kalma süresi 31.2 (29.2-36.2) gündü. Hastaların takiplerinin sonunda 18 hastaya (% 82) kateterin çıkarılması dışında ek işlem yapılmazken, 4 hastaya (18%) ileri tedavi yapıldı.

Sonuç: Radder tarafından 1980 yılında PK işlemi ilk kez tariflenmesinden itibaren kullanımı giderek artmaktadır. Yüksek kardiyak ve pulmoner sorunları olan yaşlı hastaların tedavilerinde PK sıklıkla kullanılmaktadır. PK'ler yüksek riskli yaşlı hastalarda düşük maliyeti, hızlı etkili olması ve düşük komplikasyonlarıyla akut kolesistitli hastalarda, geçici veya kalıcı tedavi metodu olarak kullanılabilir.

Anahtar Sözcükler: Akut Kolesistit, Yaşlı Hastalar, Perkütan Kolesistostomi, Kolesistektomi.

The most commonly accepted treatment for acute cholecystitis (AC) is laparoscopic or conventional cholecystectomy (1). Although operative mortality is less than 1%, the mortality rate can increase up to 30% in geriatric patients with accompanying comorbidities (2, 3). In such cases, a percutaneous cholecystostomy (PC) may be listed among the treatment options. A PC is an image-assisted surgical procedure involving the emptying of the gallbladder content (4). As it is a mi-

nimally invasive procedure and can be performed ultrasonographically with local anesthesia (5, 6), it is used as an alternative to the definitive treatment or as a way to gain time for definitive treatment in high-risk geriatric patients (7, 8).

In this study, we present cases of geriatric patients with accompanying comorbidities who were admitted to our clinic. Following diagnosis of AC, a percutaneous cholecystectomy was performed on the patients,

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and they received followed-up care at our clinic.

MATERIAL and METHODS

Methodology and Ethics

This study was conducted in the Surgery Department of the Adana Numune Training and Research Hospital from between November 2011 and October 2014. A total of 22 patients diagnosed with AC, who were above the age of 65 and underwent a PC due to operative comorbidities, were eligible for the study. The study was conducted retrospectively, and the patients' age, gender, cholecystostomy indications, accompanying diseases, duration of stay in hospital, duration of follow-up, amount of drainage after the procedure, culture results, success of the procedure, complications related to the procedure and records of the surgical and medical treatments after PC were compiled and recorded. Cases with an AC diagnosis based on ultrasonographic hydrops, pericholecystic fluid and a wall thickness in the gallbladder of more than 3 mm, in addition to pain in the upper right quadrant, leukocytosis and high C-reactive protein levels were accepted. Patients were informed of the risks associated with the use of anesthesia and their consents for the procedure were received. Before and after the procedure, the status of the patients' cholecystitis was examined. The Ethical Committee of our center approved the study protocol (ANEAH.EK.2014/112).

PC Technique

The PC was performed under local anesthesia using the Seldinger technique (8) accompanied with ultrasonography. With this method, after entering the gallbladder transhepatically and aspirating the bile, the needle was fixed to the upper right quadrant of the abdomen using an 8F catheter with the aid of a guide (Figure 1).

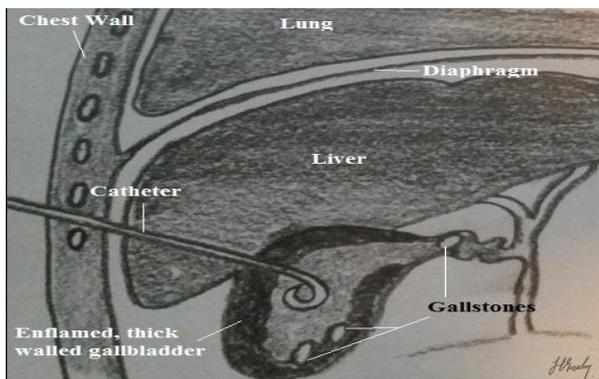


Figure 1. Percutaneous Transhepatic Cholecystostomy Technique

Recovery criteria after PC

The decrease or disappearance of pain in the right upper quadrant, absence of fever, the initiation of the normal enteral feeding, normal range of C-reactive protein (CRP) and white blood cell (WBC), decrease or lack of thickness of gallbladder wall and pericholestatic fluid with ultrasonography.

RESULTS

Of the 22 patients who had undergone PC, 9 were female, 13 were male and the average age was calculated as 76.5 (min - max: 65 - 88). PC indication was acute calculous cholecystitis in 15 (68%), non-calculous cholecystitis in 6 (27%) and gallbladder perforation in 1 (5%) of the patients (Table 1, Figure 2). Additional comorbidities, along with age, were heart failure in 12 (55%), advanced respiratory system disease in 8 (36%), use of anticoagulant medication in 11 (50%), uncontrolled diabetes in 6 (27%), hypertension in 7 (32%), thrombocytopenia in 1 (5%) and chronic kidney failure in 6 (27%) of the patients. The average duration of stay in the hospital for the 22 patients was calculated as 7 days (range 2 - 12). No mortality was seen in the hospital or in the first 30 days. The patient's mean follow-up period was 28.2 (\pm 7.65) months and the mean duration of drain was 31.2 (29.2-36.2) days. Regarding the aspirated bile cultures, 11 (50%) of them showed growth, while 11 (50%) were found to be negative. In the cultures of the patients, E.coli grew in 6 (27%), Enterococcus grew in 2 (9%) and Pseudomonas grew in 1 (5%). Two of the patients' cultures showed a mixed type of growth. Definitive treatment was performed on 4 (18%) of the patients, and a catheter was removed from 18 (82%) of the patients, without any additional procedures (Tables 1 and 2). In 2 of the patients who had definitive treatment, a laparoscopic cholecystectomy was performed, where 1 of the patients had a conventional cholecystectomy and the other had a conversion cholecystectomy. 2 of the 4 patients who performed definitive treatments were calculous cholecystitis and others were acalculous cholecystitis and perforated cholecystitis. The patient with perforated cholecystitis underwent operation on the 7th day of medical treatment without second PC tube. Despite medical treatment and PC, these patients did not heal in terms of clinical, laboratory and imaging parameters, and therefore cholecystectomy was performed. 5 patients who performed the PC had an AC attack after removed PC. The appropriate antibiotics were applied and with the stop of oral feeding these patients were discharged with healing. In these patients, cholecystectomy or repeat PC was not performed.

Table 1. Demographic and Clinical Features

Age	
Median ± SD	75,7±7,3
Median (min-max)	76,5 (65-88)
Gender	
n (%)	
Male	9 (%41)
Female	13 (%59)
BMI (kg/m²)	
	25,2
Diagnosis	
Calculous Cholecystitis	15 (%68)
Acalculous Cholecystitis	6 (%27)
Perforated Gallbladder	1 (%5)
Cultures	
Negative	11 (%50)
E.coli	6 (%27)
Pseudomonas	1 (%5)
Enterococcus	2 (%9)
Mixed	2 (%9)
Definitive Surgery	
None	18 (%82)
Yes	4 (%18)

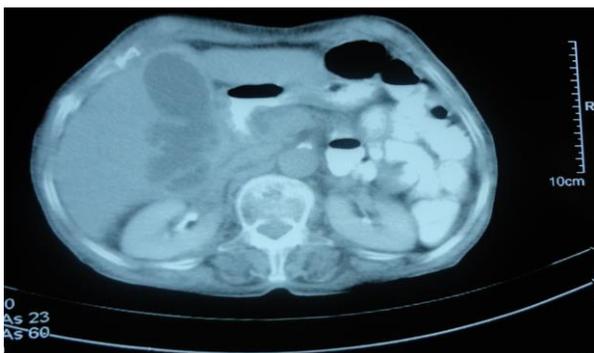


Figure 2. Perforated Gallbladder

Table 2. Co-morbidities and Follow-up

Co-morbidities	n (%)
-Heart Failure	12 (%55)
-Advanced Respiratory System Disease	8 (%36)
-Using of Anticoagulant Medication	11 (%50)
-Uncontrolled Diabetes Mellitus	6 (%27)
-Hypertension	7 (%32)
-Thrombocytopenia	1 (%5)
Chronic Kidney Failure	6 (%27)
Follow-up	
-Length of hospital stay (days)	7 (2-12)
-Mean Follow up (months)	28.2 ± 7.65
-Mean duration of drain (days)	31.2 (29.2-36.2)

DISCUSSION

The incidence of AC increases with age. Surgery in AC cases involving high-risk, geriatric patients may lead to serious morbidity and mortality (3). For these patients,

PC can serve as a life-saving procedure, insofar as it provides 98% biliary drainage. Moreover, this procedure can buy time for both the patient and the surgeon in cases where elective surgery is being considered (4, 9, 10). The method was first described by Radder in 1980 in a case of gallbladder empyema (6), and to date, many studies have confirmed the safety and effectiveness of the method.

PC is usually performed under local anesthesia by an invasive radiologist who places a catheter into the gallbladder transhepatically or transperitoneally with the aid of ultrasonography. The more oftenly preferred method is the transhepatic cholecystostomy, where there is a lower chance of a biliary leak. If there is an anatomical misfit or coagulopathy, the catheter can be placed transperitoneally (12). Morbidities related to PC procedures are between 8-44%. Major complications involved with PC procedures include catheter dysfunction, misplacement of the catheter, injuries of the biliary ducts and intracholecystic hemorrhage (11). In all of our cases, transhepatic cholecystostomy was performed and no complications occurred (Figures 3 and 4).



Figure 3. In a case of gallbladder perforation, total resorption in the cholecystogram performed after percutaneous cholecystostomy.

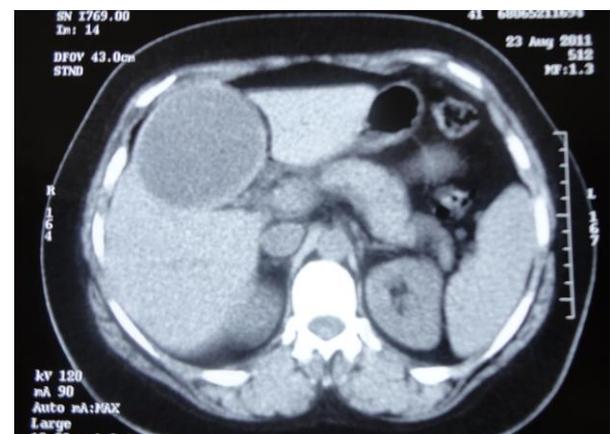


Figure 4. A hydropic gallbladder with thick wall

As there is no guideline governing the follow-up care involving the cholecystostomy tube and catheter in

cases of PC, the clinics must rely largely on their experience in performing follow-up drainage procedures (7, 11, 13). Kortram *et al.* (7) stated that the drain should stay for at least three weeks, at which point the catheter can be pulled out if the cystic duct is observed to be open in the cholecystogram. In the study conducted by Sanjay *et al.* it was stated that the drain should stay for at least six weeks and then can be pulled if the passage is observed to be open on the cholangiogram (11). Lastly, Cha *et al.* (13) stated that in cases that show clinical improvement, the passage should be checked with cholecystogram and if the passage is open, the drain should then be clamped and pulled out at the end of the third day in the absence of any clinical findings. In our clinical experience, we believe that the drain should stay for at least three weeks in order for the tract to form and to prevent biliary leaks. Furthermore, if the cystic duct is observed to be opened on the cholecystogram taken at the end of third week, the catheter should be clamped and pulled out at the end of the third day. In cases where the cystic duct is blocked, we hold that the drain should be pulled out if there is no hydrops shown on the ultrasonography taken after the drain is clamped. For cases where the biliary duct is shown to be blocked in the cholangiogram, a cholecystectomy should be performed; if, however, that is not possible, then the catheter should remain for three more weeks. Biliary blockage was present in the cholangiogram in 4 of our cases. Only 1 of them had a cholecystectomy, while the other 3 were not able to be operated on because of high risk. These 3 patients had their catheters pulled out at the end of the sixth week and were discharged with antibiotic treatment. No problems were encountered during the follow-ups.

One of the more contentious issues for patients who have had a PC involves post-drainage procedures, where it is debated whether or not an elective cholecystectomy can be performed (14, 15). In some studies, it is emphasized that an elective cholecystectomy should be performed, as there is a higher rate of the recurrence of biliary complications with the pulling of the cholecystostomy tube (5, 15). In contrast, some studies have emphasized that biliary complications are rarely encountered and that to insist on the administration of a cholecystectomy for cases showing high risks associated with the use of anesthesia increases mortality and morbidity (13). Morse *et al.* (16) stated that in the 19 cases where a PC was performed, only 1 of them had a recurrent biliary complication and these complications were able to be managed with conservative medical treatment.

The recurrence rate after PC treatment ranged from 4% to 23% (11, 15-18). The causes of recurrence after removed PC are usually calculous cholecystitis, early removal of PC, inadequate medical treatment of cholecystitis attack. There is not a certain consensus for treatment of recurrence cholecystitis after removed PC. There are some controversial treatment approaches for recurrence cholecystitis including medical treatment,

repeated insertion of PC, early cholecystectomy, interval cholecystectomy. Conservative treatment options are frequently recommended because of high comorbidity by ASA (American Society of Anesthesiologists). In a study on the PC for AC conducted by Sanjay *et al.* (11), they reported that 13/53 (22%) patients readmitted with recurrent cholecystitis during follow up of which 7 (54%) had a repeated PC. In a study on the AC in the elderly conducted by McGillicuddy *et al.* (17), they suggested that medical management, with interval cholecystectomy only for recurrent AC, might be appropriate in selected patients. In a study on the PC for AC in patients with high comorbidity and reevaluation of treatment efficacy conducted by Chang *et al.* (18), they reported that a temporary PC could be a first-line treatment for AC without interval cholecystectomy.

In the 22 cases of our study, 18 had the catheter pulled out and did not have a cholecystectomy because of high anesthesia risk, and 4 had a cholecystectomy after the acute condition was remedied. 2 of the 4 patients who performed cholecystectomy were calculous cholecystitis and others were acalculous cholecystitis and perforated cholecystitis. The patient with perforated cholecystitis underwent operation on the 7th day of medical treatment without another PC tube. Despite medical treatment and PC, these patients did not heal in terms of clinical, laboratory and imaging parameters, and cholecystectomy performed. Patients who had a cholecystectomy usually had treatable accompanying conditions; 1 of them had thrombocytopenia related to chronic ITP and the other 3 were on anticoagulant medicine. A cholecystectomy was performed on these patients after the risk for elective surgery was minimized, and no complications were seen. No recurrent biliary complications were observed. In present study, the one year recurrence rate was 5/22 (22%) after PC treatment and it is similar to the literature. The appropriate antibiotics were applied and with stopping of oral feeding these patients were discharged with healing. In patients with recurrent cholecystitis, cholecystectomy or repeat PC was not performed.

There are some limitations in our study. Firstly, our study is a retrospective observational study and as such, we were only able to establish an association, rather than relation between independent and outcome variables. Secondly, number of patients was low in the present study and thirdly, we evaluated only our hospital's data, the recurrence rate might be underestimated because patients would receive treatment for recurrence at other hospitals.

As a low cost, quickly effective, time saving treatment method with low complication rates, PC can be used as a temporary or definitive treatment method for high-risk geriatric patients with AC. The patient should be re-evaluated after the acute condition settles, and the decision to perform a definitive treatment should only be made after a risk evaluation has been done for the administration of anesthesia.

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