Pancreatitis is a severe illness within the field of internal medicine. Additionally, 10% to 20% of pancreatitis patients are diagnosed with severe pancreatitis, which can lead to complications such as tissue necrosis, peripancreatic abscesses, or pseudocysts [1, 2, 3]; these conditions present mortality rates of between 10% and 40% [2]. In addition, the prevalence of pancreatitis-induced hemorrhage was between approximately 1.3% and 14.5% [4, 5]. Severe pancreatitis also leads to sepsis and organ failure, which present mortality rates of between approximately 20% and 70%. To prevent sepsis-induced organ failure, severe pancreatitis should be treated with active infection interventions, including the administration of antibiotics, percutaneous drainage, endoscopy-guided drainage, or surgical debridement [6-11]. Currently, numerous studies have recommended using microinvasive methods to drain abscesses; however, drainage tubes are often obstructed by viscous pus and tissue residue. Thus, in this article, we propose an improved drainage method to solve the problem of drainage tube obstruction.

RESULTS

Following pus extraction using the suction tube method, the patients received a computerized tomography (CT) scan. The results showed that the size of the patients’ abscesses declined substantially (Fig. 2), and the content was nearly completely extracted. The average length of hospitalization was 47 days. The patients were periodically

A Modified Drainage Method for Peripancreatic Abscess

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ABSTRACT

Severe pancreatitis can induce a peripancreatic abscess, and drainage of the abscess is the primary treatment applied to this condition. However, drainage tubes are often obstructed by viscous pus and tissue residue. Failure to treat a pancreatic abscess can lead to complications such as sepsis and organ failure, ultimately resulting in death. To improve drainage quality and solve drainage tube obstructions, we used suction tubes connected to a suction bottle during patient treatments. We found that this assembly not only demonstrated excellent drainage performance for severe peripancreatic abscesses, but was also cost efficient.

MATERIALS AND METHODS

Reviewing data from the last 8 years (2004 to 2012), a total of 15 patients were diagnosed with severe pancreatitis and peripancreatic abscess (Fig. 1). Of these patients, 13 were men and 2 were women and their ages ranged between 47 and 82 (average age of 62.7). Subsequently, 9 of the patients were diagnosed with Grade D pancreatitis, and 6 were diagnosed with Grade E pancreatitis. Moreover, 5 of the patients developed hemorrhage around the pancreas 1 week after hospitalization, for which 4 patients were transferred to an intensive care unit. All patients underwent percutaneous drainage (10-12 Fr. pigtail catheter), 4 patients received 2 tube replacements, 7 received 3 replacements, 2 received 4 replacements, and 2 received 6 replacements. The average duration of use for each drainage tube was 2.3 days. All the patients underwent pus drainage using suction tubes (Lily, CSA-5112A, 12 Fr.); however, 12 patients were treated once, and 3 were treated twice. The method of suction tube insertion similar to pig-tail catheter insertion. An average of 525 cc of pus and tissue residue was extracted from each patient.

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monitored for 1 year following hospital discharge. The follow-up results showed that the patients demonstrated excellent tissue healing, and residual abscesses had completely disappeared.

**DISCUSSION**

Peripancreatic abscess is the most severe complication associated with pancreatitis [1, 2, 8], and a troublesome symptom in clinical practice. Microinvasive drainage methods are the primary treatment methods currently employed for this symptom [1-6]. Because of the characteristics of pancreatitis and the formation of abscesses, the content of peripancreatic abscesses is typically extremely viscous and contains tissue residue. This often causes obstructions in drainage tubes necessitating their continuous revision. Unfavorable drainage conditions not only prolong patients’ recovery periods, but can also cause the formation of fistulas between surrounding organs or skin, and even cause sepsis and organ failure, ultimately resulting in death.

In this investigation, 15 cases of severe pancreatitis with peripancreatic abscess were observed. These cases underwent percutaneous drainage treatment, which resulted in frequent tube obstructions and repeated tube revisions. However, surgeons advised against surgical treatment because the patients were malnourished, which increases potential complications for wound recovery [10, 11]. Thus, the clinical physicians recommended that the drainage functions be improved to resolve this troublesome problem. By comprehensively investigating the characteristics of peripancreatic abscesses and the configuration of drainage tubes, we found that the tube diameter and side holes were excessively small, impeding the flow of viscous pus and tissue residue, causing obstructions and poor drainage performance. Because we cannot change the characteristics of abscesses, we focused on improving drainage methods. First, we enlarged the diameter and side holes of the drainage tubes; however, test results showed that the viscous pus remained difficult to extract and that tissue residue continued to cause blockages. Finally, we formulated the idea of incorporating a suction tube (12 Fr) and a suction bottle (15 cmHg) into the pus extraction process. Following repeated perfusion and extraction, the majority of the pus was successfully extracted. This success was primarily because the diameter and side holes of the suction tubes employed in this research were substantially larger than those of conventional drainage tubes (the 12Fr. pigtail cather has four side holes, 2x3mm; the 12Fr. suction tube has two side holes, 4x5mm), particularly because the viscosity of the pus was similar to that of phlegm. Most importantly, the suction bottle provided a stronger suction force for extracting both pus and tissue residue. After the procedure, a pigtail catheter (10-12 Fr) was introduced and the patients’ condition was monitored using a CT scan. The results showed that the patients’ abscesses had shrunk considerably.

For extremely viscous peripancreatic abscess pus that contains tissue residue, the use of various drainage methods and tools can effectively enhance drainage performance, reduce complications, accelerate recovery, and reduce the duration of patient hospitalization without additional costs.

**Figure 1**. Non-contrast abdomen CT scan revealed severe acute pancreatitis with peripancreatic and retroperitoneal abscess formation.

**Figure 2**. Non-contrast post-drainage abdominal CT scan revealed nearly total regression of peripancreatic and retroperitoneal abscess.
REFERENCES