

PERCUTANEOUS ABSCESS DRAINAGE OF INTRA-ABDOMINAL ABSCESSES AND FLUID COLLECTION

Komgrit TANISARO

PURPOSE : To assess the safety and efficacy of Percutaneous Abscess Drainage (PAD) of intra-abdominal abscesses or fluid collections with small-bore catheter in patients who were followed up for 2 years.

MATERIALS AND METHODS : Retrospective analysis was performed in 55 consecutive PAD patients who were treated from July 1993- May 1996 in whom 2-years follow up data were available. Results of PAD were defined as cure, palliation/temporization and failure.

RESULTS : 55 abscesses and fluid collections were drained in 52 patients. Cure rate, palliation/temporization rate and failure rate were 68, 17 and 15 percent respectively. Catheter complication was 19 percent. Minor complication was 10 percent. One patient died due to intraperitoneal bleeding. Recurrent rate was 2.4 percent. Most of PAD were performed by small-bore catheter.

CONCLUSION : Our 85 percent success rate of PAD with small-bore catheter and acceptable minor complication rate indicate efficacy and safety of this technique in treating intra-abdominal abscesses and fluid collections.

Index term : Abdomen, abscess
Abscess, percutaneous drainage
Interventional procedures

Abbreviation : PAD = Percutaneous Abscess Drainage
US = Ultrasonography
CT = Computed Tomography

Percutaneous drainage has quickly become the preferred treatment for various type of abscesses and fluid collections. It is also the treatment of choice for the majority of intra-abdominal abscesses and fluid collections, regardless of etiology.¹ The safety, efficacy, and ease of the procedure have revolutionized the treatment of abscess. Few radiological procedures has been accepted so uniformly by nonradiologists as has percutaneous abscess drainage.² Imaging technique such as US and CT have greatly enhanced

an ability to properly locate abscesses and identify daughter abscesses, extensions, and area of loculation or subseptation.³ Percutaneous drainage has several advantages over and at least as efficacious as operative drainage.⁴

Most published studies did not show any long-term clinical follow-up. Thus, recurrence rates of abscesses are difficult to determine. A consecutive series of 44 percutaneous drainage of intra-abdominal abscess and fluid collection in 41

Department of Radiology Hospital of Prince of Songkla University Hatyai, 90110, Thailand

Correspondence to: Komgrit Tanisaro, MD telefax: 074-212900 telephone: 074-212070 e-mail: tkomgrit@ratree.psu.ac.th

patients with at least 2 years clinical follow-up was carried out.

MATERIALS AND METHODS

Retrospective analysis was performed in 52 patients who underwent PAD of intra-abdominal abscess or fluid collection between July 1993 to May 1996 in whom at least 2 years follow-up information were available. Selective criteria included 1) a well-established, unilocular fluid collection having variable ultrasonography or CT scan signs of abscess, 2) patients in whom percutaneous technique was thought to be preferential to operative technique (i.e., poor anesthetic risk, a recent cerebrovascular accident), or 3) patient or physician preferences.

All data were reviewed from the radiology information sheet which was filled by interventional radiologist performing the PAD and from the medical record of the hospital. The collected data were 1) patient profiles. 2) past medical and surgical history. 3) suspected cause(s) of abscess or fluid collection. 4) underlying disease(s). 5) antibiotic uses. 6) septic and coagulopathic laboratory results. 7) imaging modalities used in diagnosis and intervention. 8) method of drainage. 9) equipment and catheter used in PAD. 10) postprocedural care and complication(s). 11) duration of catheter placement. and 12) duration of hospital stay.

Percutaneous management was defined as "cure" if complete resolution of clinical signs and symptoms occurred in long-term clinical follow up (at least 2 years) and diagnostic imaging showed complete resolution of the abscess cavity. It was defined as "palliation/temporization" if resolution of the abscess improved the patient condition prior to adjunctive surgery to remove the underlying cause or an improvement in signs and symptoms with the patient clinically stable but not cured. Finally, it was defined as "failure"

if patient failed to meet the criteria for cure and palliation/temporization.

All PAD were performed by one interventional radiologist (K.T). All data from the radiology information sheet were entered onto computer software (Microsoft-excel, version 6.0)

RESULTS

Fifty-five abscesses or fluid collection were drained in 52 patients. 2 years follow-up could be performed in 41 patients who regularly visited or admitted by problem not related to abscess or fluid collection. The patients ranged in age from 2 months to 81 years (mean, 42 years). There were 24 males and 17 females. There were 20 patients (48%) with postoperative abscess or fluid collection: 4 occurred after operation due to severe blunt abdominal injury, 4 after Whipple's operation, 4 after gastric surgery, 3 after common bile duct surgery or stenting and 2 after splenectomy. Three postoperative patients had 2 sites of collection. Locations of postoperative abscess or collection were left subphrenic space in 7, right subphrenic space in 6, interloop region in 6, perihepatic region in 5, and paracolic space in 3. 8 patients (19.5 percent) had liver abscesses. Three of them were ruptured status.

The imaging guidance were ultrasonography with fluoroscopy in 33 patients, ultrasonography alone in 5 patients, CT scan alone in 2 patients and fluoroscopy alone in 1 patient. Route of access were anterior abdominal wall in 17 patients, lateral abdominal wall in 7 patients, right intercostal space in 9 patients, left intercostal space in 6 patients, transincision in 1 patient and transrectal in 1 patient.

Catheter french size included 8.5-F in 20 patients, 8-F in 5 patients, 10-F in 3 patients and 12-F in 2 patients. Angiocatheter technique (Modification of the Seldinger techniques used in

angiography) was used in nearly all patients except one whom trocar catheter technique was used. Type of drainage catheter were Cope-loop nephrostomy catheter (COOK®, Bloomington, IN, USA) in 32 patients and Hydrophilic pigtail drainage catheter (Meditech®, Watertown, MA, USA) in 3 patients. The rest were locally hand-made 8-F self-retaining loop catheter. Drainage catheter remained in position 5-24 days (mean, 13 days). To evaluating size of abscess or fluid collection, ultrasound alone, fistulography alone and combination were performed in 30, 5 and 5 patients respectively.

Patients were febrile (body temperature above 37.5 Celsius) in 35 cases. Thirty-one patients (75%) were defevered and 4 patients were sustained. In all patients, the cure rate was 68.5 percent (28/41), palliation/temporization rate was 17 percent (7/41) and failure rate was 12 percent (5/41). Cure and palliation/temporization rate were 95 percent (19/20) in the postoperative group compared to 76 percent (16/21) in the non-postoperative group. Non-ruptured liver abscesses had a cure rate of 80 percent (4/5). Percutaneous biliary drainage was also performed in one case successfully. One of them were recurrent after 2 months.

Catheter complications were found in 8 patients (19%): displacement, occlusion and dislodgment in 3, 3 and 2 patients respectively. Three of these complicated patients were treated by repositioning the drainage catheter and 1 by single additive percutaneous aspiration. Other minor complication such as minor bleeding, inflammation at punctured site, pericatheter leakage were found in 4 patients. One patient who had peripancreatic collection with acute hemorrhagic pancreatitis died 6 hours after PAD. Postmortem abdominal tapping revealed a large amount of intraperitoneal hematoma. Three patients died from causes not related to the procedure (1 from lung metastasis, 1 from complication of a later operation and 1 from uncontrollable pneumonia)

DISCUSSION

Percutaneous Abscess Drainage (PAD) has now become a standard technique for dealing with intra-abdominal abscesses and fluid collections in 50-90 percent of cases. Controversy has sometimes been seen as a territorial battle between surgeons and radiologists and most cases are clearly the prerogative of one discipline or the other, but many are in a gray zone in which clearly defined indications are not readily available.⁵ PAD has several advantages over surgical drainage including 1) external drainage without risk of contamination or spillage intra-abdominally or into the operative wound, 2) avoidance of surgery, general anesthesia, and related postoperative complications, 3) reduced duration of drainage, 4) probable saving of time and expense, 5) better patient acceptance, 6) easier nursing care, 7) earlier diagnosis and treatment, which may account for decreased mortality and morbidity rates, and 8) a lower incidence of inadequate drainage.⁴

Our study has a very favorable success rate of 85 percent. Its is quite similar to those reported in literature.⁶⁻⁸ Most complications in this series were minor (29%), mainly related to catheter problems. This rate is acceptable as compared to 0-31 percent in previously reviewed studies.⁶ Many reports about PAD did not give consistent clinical follow-up and some did not calculate the recurrent rate. We did follow all 41 patients for at least 2 years and found only 1 recurrence (2.4%) in patient with amoebic liver abscess. Lambiase et al.,⁹ reported a 1-year follow up series with 2.1% recurrence 335 abscesses and believed that most recurrences would be evident within 2-3 months of the initial abscess drainage and most would be due to an incompletely treated abscess or to unrecognized communications rather than failure to obliterate completely an anatomic nidus.

Most of causes of death in this series were

not related to PAD except one who had intraperitoneal bleeding after drainage a pancreatic abscess. Mortality rate of surgery in pancreatic abscesses ranged from 22-43%.¹⁰⁻¹¹ Success rate was not acceptable when comparing to non-pancreatic abscesses^{9,12-14} Some authors¹⁵ recommended that pancreatic abscesses should be generally treated by surgical debridement, and usually accompanied by repeated explorations.

Result in postoperative abscesses or fluid collections were more favorable than non-operative group significantly in our series (95% VS 76%). Mclean et al.,¹⁶ concluded from their data that PAD is of value only in selected cases. If an anastomotic dehiscence is a possibility the patient should be managed operatively.

The duration of catheter placement in our series was 13 days in average which is longer than most reports¹⁷⁻¹⁹ An explanation is our use of a small-bore catheter. More than 60% of small-bore drainage catheter (less than 10-F) was used in our series. A large-bore catheter (more than 10-F) was used in a limited number of patients. Other possible causes of greater duration of drainage are lack of routine irrigation program and routine suction connecting to the drainage catheter.

In conclusion, successful drainage is achieved in 85% of cases with an acceptable rate of complication and recurrence in long-term follow-up. PAD has now become a standard technique for dealing with nearly all kinds of intra-abdominal abscesses and fluid collections.

REFERENCES

1. Van Gansbeke D, Matos C, Gelin M, Muller P, Zalcman M, Deviere J et al., Percutaneous drainage of subphrenic abscesses. *British J Rad* 1989;62:127-133
2. Van Sonnenberg E, D'Agostino H, Casola G, Halasz N, Sanchez R, Goodacare B. Percutaneous Abscess Drainage: Current concepts. *Radiology* 1991;181:617-626
3. Lang EK. Renal, Perirenal, and Pararenal Abscesses: Percutaneous Drainage. *Rdiology* 1990;174:109-113
4. Johnson WC, Gerzof SG, Robbins AH, Nabseth DC. Treatment of Abdominal Abscesses. *Ann Surg* 1981;194:510-519
5. Bartlett JG. Intra-abdominal sepsis. *Med Clin North Am* 1995;79:599-617
6. Haaga JR. Imaging intraabdominal abscesses and nonoperative drainage procedures. *World J Surg* 1990;14:204-209
7. Van Sonnenberg E. Percutaneous drainage of abscesses and fluid collections: Technique, results and applications. *Radio-logy* 1982;142:1-10
8. Martin EC. Percutaneous drainage of postoperative intraabdominal abscesses. *Am J Roentgenol* 1982;138:13-15
9. Lambiase RE, Deyoe L, Cronan J, Dorfman GS. Percutaneous drainage of 335 consecutive abscesses: results of primary drainage with 1-year follow-up. *Radiology* 1992;184:167-179
10. Altmeier WA, Alexander JW. Pancreatic abscess: a study of 32 cases. *Arch Surg* 1963;87:80-89 (abstract)
11. Bittner R, Block S, Buchler M, Beger HG. Pancreatic abscess and infected pancreatic necrosis: difficult local septic complications in acute pancreatitis. *Dig Dis Sci* 1987;32:1082-1087 (abstract)
12. Steiner E, Mueller PR, Hahn PF, Saini S, Simoone JF, Wittenberg J et al., Complicated pancreatic abscesses: problems in interventional management. *Radiology* 1988;167:443-446

13. Van Sonnenberg E, Wittich GR, Casola G, Stauffer A, Polansky AD, Coons H et al., Complicated pancreatic inflammatory disease: Diagnosis and Therapeutic role of Interventional Radiology. *Radiology* 1985; 155:335-340
14. Freeny PC, Lewis GW, Traverso W, Ryan J. Infected pancreatic fluid collections: Percutaneous catheter drainage. *Radiology* 1988;167:435-441
15. Levinson MA. Percutaneous versus open operative drainage of intra-abdominal abscesses. *Infect Dis Clin North Am* 1992; 6:525-544
16. Mclean TR, Simmons K, Svenson LG. Management of postoperative intra-abdominal abscesses by routine percutaneous drainage. *Surg Gynecol Obstet* 1993; 176:167-171
17. Gerzof SG, Robbins AH, Johnson WC, Birkitt DH, Nabseth HD. Percutaneous catheter drainage of abdominal abscesses. *N Engl J Med* 1981;305:653-657
18. Van Sonnenberg E, Ferrucci JT Jr, Mueeler PR, Wittenberg J, Simeone JF. Percutaneous drainage of abscesses and fluid collections: technique, results and applications. *Radiology* 1982;142:1-10
19. Van Sonnenberg E, Mueeler PR, Ferrucci FT Jr. Percutaneous drainage of 250 abdominal abscesses and fluid collections. Part I. Results, failures and complications. *Radiology* 1984;151:337-341