Management of colorectal emergencies: percutaneous abscess drainage

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Introduction

Among the several complications which still influence the outcomes of colorectal surgery, pelvic abscesses still represent the most frequently observed (1). Up to 15 years ago treatment of such a complication consisted of "open surgical drainage" whose mortality rate reached a discouraging 50% in some series (1, 2); then, CT and US guided percutaneous drainage of intrabdominal abscesses showed to be an effective alternative to surgical treatment as reported in several papers (3, 4, 5, 6, 7, 8, 9, 10, 11) which presented a higer success rate, low mortality and morbidity as compared to laparotomy, shorter hospital stay and reduced cost (3-9, 10, 11, 12). Gradually, the indications of percutaneous drainage expanded from the treatment of single and well defined collections (2) to multiple and multiloculated collections (13, 14) even associated to enteric fistulas (14-16) acute diverticulitis (9, 17, 18) and Crohn's disease (3, 19). Actually, percutaneous abscess drainage (PAD) success rates range from 33 to 91% (20) being the wide variation probably due to differences concerning collections' com-plexity, diversity of single cases and modality in performing the PAD procedure. The-refore, a better selection of PAD indications and more accurate identification of the outcomes associated factors should be needed. The treatment of a single, well defined post-operative faecal

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Riassunto

TRATTAMENTO DELLE EMERGENZE COLORETTALI: DRENAGGIO PERCUTANEO DI ASCESSI

Gli ascessi pelvici rappresentano ancora la più frequente complicanza della chirurgia colorettale. Il drenaggio percutaneo (DP) TC e US guidato può essere oggi una alternativa al drenaggio chirurgico, gravato da significativi tassi di mortalità. In questo studio i risultati del DP effettuato in 39 pazienti con ascessi addomino-pelvici, sono stati valutati retrospettivamente allo scopo di verificare la efficacia della procedura. La gran parte degli ascessi 33 (85%) erano secondari a chirurgia resettiva colorettale, 20 (51%) derivavano da una deiscenza anastomotica, 22 (56%) erano mal delimitabili, 16 (41%) multiloculati, 23 (58%) avevano dimensioni maggiori di 10 cm; 16 (41%) presentavano contaminazione fecale; 14 (35%) erano multipli. Nonostante il notevole numero di ascessi complessi, la guarigione è stata ottenuta nel 89,74% dei casi con risoluzione della sepsi in 5,1± 2,9 giorni, in assenza di mortalità e con solo il 5% di complicanze peraltro, minori. La TC si è dimostrata il mezzo migliore, per valutare la sede, e le caratteristiche della raccolte, e la guida più idonea per il drenaggio. L'adeguato, calibro del catetere è risultato essenziale per il successo del trattamento. In particolare è necessario impiegare cateteri di calibro >20Fr in caso di ascessi con contaminazione fecale associata a deiscenza anastomotica. In 4 pazienti, anziani con malattia neoplastica e con patologie croniche associate (10%), era state, possibile posizionare solo un catetere di piccolo calibro e il DP è risultato inefficace. Comunque anche in questi pazienti è stata notata una parziale risoluzione della sepsi e un marcato miglioramento delle condizioni generali così da permettere il successivo drenaggio chirurgico. In conclusione il DP è una tecnica relativamente semplice ed efficace che può essere utilizzata in alternativa al drenaggio chirurgico o almeno come prima misura, anche in presenza di ascessi complessi.
Parole chiave: Ascessi intra-addominali, drenaggio percutaneo, drenaggio TC guidato.

Abstract

Pelvic abscesses represent the most frequent complications of colorectal surgery. Percutaneous CT or US guided drainage can be an alternative to surgical drainage that is asso-

ciated to a significant mortality rate. In the current study results of PAD, performed in 39 patients with pelvic or abdominopelvic abscesses were reviewed in order to evaluate reliability of such procedure. Major part of the collections 33/39 (85%) developed after resective colorectal surgery, and 20/39 (51%) were associated to anastomotic fistula; 22/39 (56%) were poorly defined; 16/39 (41%) were multiloculated; 16/39 (41%) had a stool contamination, 23/39 (58%) were greater than 10cm; 14/39 (35%) were multiple. Thirty-five patients (89,7%) healed, despite high number of complex abscesses and complete resolution of sepsis was achieved in 5,1+/–2,9 days. CT proved to be the most reliable tool in assessing distinctive features of collections as well as in identifying the best route for drainage. Adequate size of the catheter was essential to get an effective drainage. In particular, large sized catheter (>20Fr) had to be used to drain collections associated to anastomotic fistulas with stool contamination. In four elderly neoplastic patients with chronic illnesses (10%), only a single small sized catheter could be positioned, because of patients poor compliance and PAD) was inaffective. Nevertheless even those patients got a partial resolution of the sepsis and their general conditions markedly improved, so that they were able to underwent successfull surgical drainage. In conclusion PAD) is a safe and reliable tool that can be employed as an alternative to surgical drainage at least as first measure, even if complex pelvic abscesses are found.
Key words: Intra-abdominal ascess, percutaneous drainage, CT-guided drainage.

contamination without ongoing sepsis still remains the indication of choise with success rates of 100% (14). PAD seems to be effective in case of anastomotic dehiscence and/or severe intraperitoneal sepsis (14, 22). In this paper we discuss the indicatios and limitations of PAD.

Material and Methods

The records of 39 patients with intraabdominal abscesses complicating colo-rectal pathologies admitted to I Division of General and Gastrointestinal Surgery, between 1998 and 2002 were reviewed. Among these, 33 collections had developed after resective colo-rectal surgery (18 patients were referred to our Department from other Institutions), 2 after appendicectomy (also operated on elsewhere) and 4 were associated with perforated diverticulitis of the left colon (Fig 1). Medium age was 51±18 years (range 14-83 years); 23 pts were males and 16 females. The 33 pts with post-operative abscesses had undergone the following reconstructive procedures: 21 colo-rectal anastomoses (8 for cancer, 2 for diverticular disease, 1 for rectal prolapse), 10 colo-anal anastomoses for cancer and 2 ileoanal anastomoses after total proctocolectomy for ulcerative colitis.

In 15 cases (included the appendicectomy), the abscesses were caused by contamination; in the remaining 24 patients, trans-rectal contrastography demonstrated ana-stomotic dehiscence in 20 and perforated diverticulitis in 4 (Fig. 1).

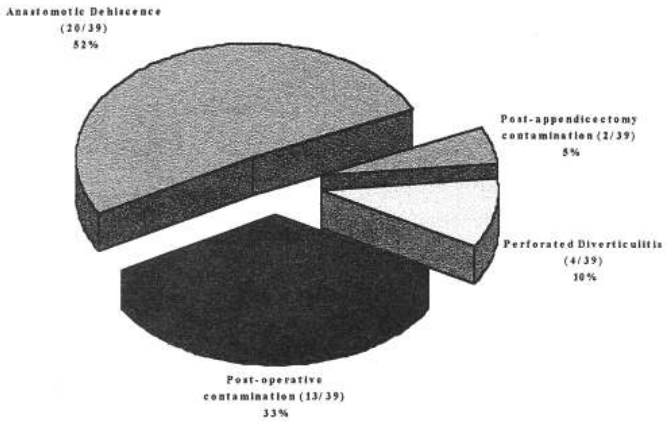

Fig. 1: Etiology of abdominopelvic abscesses.

All patients underwent a CT-scan in order to define the anatomical features of the collections. The abscesses were found to be: well defined in 17 patients, poorly defined in 22, unilocular in 23, multilocular in 16, >10 cm in 23, <10 in 16, with faecal contamination in 21. 25 patients had a single abscess and 14 had multiple collections (12 patients with double pelvic and paracolic abscess and 2 with multiple abdomino-pelvic collections after appendicectomy).

In order to obtain a better definition of the relationship between multiple collections, for a safer drainage, in some patients we performed an trans-anal contrastography under-CT scan with a very dilute contrast mean, soluble in water. In this manner, in case of anastomotic leaks or intestinal perforations, the seepage of the contrast mean allowed a direct visualization of the collection (direct contrastography). In other cases we injected contrast into the bladder in order to facilitate the visualization of a pelvic abscess (indirect contrastography). Once defined the anatomical configuration and the distinctive features of the collections and planned the shorter and safer access route for drainage, we carried out a TC-guided fine needle (19-21 G) puncture of the collection. This preliminary manoeuvre is necessary in order to both evaluate the feasibility of the chosen route and to aspirate a small amount of fluid for colture. Furthermore, it gains indispensable informations about the material that is going to be drained. Then, with the same needle, we first injected 5 nil of antibiotic solution followed by a local anaesthetic (carbocain 2%).

One patient out of 39 underwent a transvaginal needle (18 G) aspiration of a single pelvic well defined and mildly turbid collection >10 cm, with no associated stercoraceous fistula, complicating a left hemicolectomy with colo-proctoanastomosis for an eteroplasty of the recto-sigmoid junction. The remaining 38 patients were all treated by CT-guided catheter drainage (Fig. 2). We use catheter between 14 and 24 Fr, depending on the material

Fig. 2: Computed tomogram showing an intra-abdominal abscess.

obtained by the trial needle aspiration and on the presence of stool contamination of the collection. We have always used trocar introduction, which we prefer to the Seldinger technique, because it allows an easier positioning, when needed, of larger tubes (> 14 Fr).
Six contamination collections were drained by 14 Fr catheters and 7 by 16 Fr catheters. In the two patient with multiple contamination abscess following appendicectomy (which have been previously surgically drained several times) the tubes used for PAD ranged from 16 to 22 Fr. The 20 pts with anastomotic dehiscence and the 4 with perforated diverticulitis were drained by a 14 Fr catheter in two case, 18 Fr in four cases, 12 Fr in 12 and 24 Fr in 6 cases (Table I). In 6 patients with fistula and/or perforation, technical difficulties encountered during catheter positioning under local anaesthesia, moved us to use smaller size catheter (< 20 Fr). These were mostly caused by the poor compliance of the patients who were, actually, affected by severe chronic illnesses (4 cardiorespiratory and 2 epathic insufficiencies). In the 25 patients with single abscess the access route was supra pubic in 7 cases (including the 4 patients with perforated diverticulitis) and transperineal in 18 (10 perirectal, 7 transvaginal and 1 tranrectal). Out of 14 patients with multiple abscesses, 12 with double collections were drained by a combined suprapubic and transperineal access while in remaing 2 patients, with multiple post-appendectomy abscesses, a transcutaneous abdominal access was used.
Among the 38 catheter drained patients, 12 were submitted to single and 26 to double drainage (16 with anastomotic dehiscence and 10 with contamination abscesses). The second small calibre catheter (6 Fr) was used for continuous irrigation of the abscessual cavity.

Results

Transabdominal and/or trans-perineal PAD was succesfull in 35 out of 39 treated patients (89.74%). We had no mortality and very low morbidity. No "maior" complications such as colic perforation, development of intestinal fistulas and neurovascular lesions were observed. Concerning "minor" complications (drainage displacement, incomplete drainage, catheter obstruction) we had only two case of catheter displacement (5%). The 4 failures (10.25%) occurred in elderly neoplastic patients with chronic illnesses, both showing single, poorly defined, pelvic, multiloculated collections following colorectal anastomotic dehiscence. The abscesses measured > 10 cm in two patient and < 10 cm in the other two. All four patients were subsequently (10 days after PAD) submitted to successful surgical drainage. In the 35 healed patients, sepsis resolution was achieved in 5.1±2.9 days. In one case of transvaginal route 48 hours after drainage the fever subsided and normal faecal canalisation was restored. The drainage was removed after 13.1±6.9 days in patients with anastomotic fistula and in 7.8±4.9 days in the remaining patients. In 4 patients (10.25%), the

Tab. I – RELATIONSSHIPS BETWEEN PCD TECNIQUE AND ETIOLOGY OF ABSCESSES

Etiology	*Patinets*	*Catheter size*	*Single or double*	*Success rate* n°	%
Post-appendicectomy	2	16 Fr	Double	2/2	100
		22 Fr	Double		
	2	14 Fr	1 Single - 1 Double		
Anastomotic Dehiscence	2	18 Fr	1 Single - 1 Double	16/20	80
	10	12 Fr	3 Single - 7 Double		
	6	21 Fr	2 Single - 4 Double		
Perforated Diverticulitis	2	18 Fr	1 Single - 1 Double	4/4	100
	2	12 Fr	1 Single - 1 Double		
Post-contamination	7	16 Fr	3 Single - 4 Double	13/13	100
	6	14 Fr	6 Double		

positioning of further drainages was deemed necessary: in two, four days after the first PAD and in two, with multiple post-appendectomy contamination abscesses, five days after the first drainage.
Colture of the drained material revealed no bacterial growth in 8 cases while in the remaning 31 several different microorganisms were isolated (E. Coli in 12, Bacterioides fragile in 6, Pseudomonas species in 4 and polimicrobic association in 9). As for long-term outcome, 3 out of the 16 successfully treated patients (18.75%) with anastomotic dehiscence developed mildly symptomatic anastomotic strictures, which resolved, in both cases, after endoscopic pneumatic dilatations. Two of the four patients with perforated diverticulitis were succesfully treated by single-stage with sigmoid colon resection, 16 days after the acute episode.

Discussion

The PAD was initially employed for simple superficial fluid collections and gradually developed. Today the improvement of imaging (CT and US) and catheter technique has moved to utilize this procedure also in case of multiseptate, complex abscesses associated to enteric comunications and fistulas (4, 5, 10, 11). Low mortality and morbidity rates and reduced costs appear to be the main advantages of this procedure. In addiction, PAD allows the utilitation of local anesthesia (1, 23, 24, 6) and it can be performed as a bedside procedure. The main role played by CT scan in the definition of intrabdominal collections and the site of a safe puncture has been estabished (25). The US alone does not seem to be a reliable tool, probably due to the difficulty to accurately delineate the ileal loops while CT results to be particulary helpful when the abscess is located deeply in the peritoneal cavity or it is adjacent to the bowel (9, 26, 20.27). Hence endosonografic guidance appears to be indicated just in case of relatively superficial locations or when the drainage must be performed at the bedside, because of particulary critical conditions of patients (28). In our study, the individual risk factors (Apache II score) (13), the characteristics of collections (complex abscesses with fecal contamination) and the chosen PAD tehinique appear to be main factors influencing the outcomes of this procedure.
The atraumatic and small diameter tubes, utilized at the begining for percutaneous drainage, resulted unable to draine large collections of thick pus or necrotic material or become obstructed; large tubes can be more effective than pigtail catheters and safe when inserted under radiological control as referred by Voros et al (29). The catheter is usually placed through the abdominal wall even if the transgluteal, transrectal or transvaginal route are preferred in case of collection located deep in the abdomen and pelvis (30, 31, 32, 33).
In our opinion, the use of a large catether could allow an optiomal drainage and a better control of intrabdominal sepsis. If the first drainage resulted inadequate, we retained extremely important to place a second smaller sized tube for the continous irrigation of the abscessual cavity. As a matter of fact, the instillation of washing solutions fluidises the collection, thus improving drainage (mechanical bacteriostatic action) and allows the introduction into the abscessual cavity of specific antibiotic solutions (local pharmacological bacteriostatic action). We do not believe that the four failures observed in our series were completely casual: in fact they were observed in patients with pelvic collections due to anastomotic leakage, treated by single small calibre (< 20 Fr) catheter drainage. The tubes employed in these cases, respectivly 14 and 18 Fr were smaller than those usually utilized due to the poor compliance of patients during the CT catheter positioning. This observation seems to confirm that collection associated to stercoraceous fistulas should not be drained by single, small size diameter (< 20 Fr) in order to avoid catheter obstruction and/or inadequate drainage.
Several Authors (34, 35) reported similar problems by using small size catheters from 8 and 12 Fr (14, 36, 37) to a maximum size of 16 Fr (29). However our results showed that, also when PAD failed to get a complete drainage of collections, it partially resolved the sepsis and markedly improved general conditions thus allowing the successfull surgical treatment few days later.
In conclusion, given the adequate PAD technique, all patients, except those with acute severe sepsis, can benefit from percutaneous drainage, at least as first measure, because of the low mortality and morbidity rates associated to the method. Also, in patients with abscesses complicating acute diverticulitis, PAD can allow resolution of the sepsis and even healing of anastomotic fistulas, thus enabling the surgeon to carry out a subsequent single-stage procedure, avoiding an invalidating stoma and reducing hospital stay and cost.

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