

CASE REPORT

## A Case Series of Complex Pelvic Abscesses: Importance of Early Recognition and Institution of Individualised Treatment

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### ABSTRACT

Pelvic abscesses are collections of pus localized within the pelvic cavity. It may arise from intraabdominal abnormalities or a cranial extension of deep anorectal sepsis. Early recognition and diagnosis, often challenging, facilitates expedient definitive management of potential life-threatening sepsis. We describe the clinical presentation of three patients diagnosed with pelvic abscesses. The management strategies employed for each patient differed, and we described a patient-centred approach to address the underlying problem. Clinical suspicion and meticulous clinical assessment are essential for accurate and early diagnosis. Radiological and laboratory investigations can be helpful to confirm the diagnosis and aid in planning for its immediate management and subsequent definitive treatments. Meticulous attention should be paid to identifying the problem, as this will determine the best management strategy. By addressing the underlying problem adequately, we would avoid future recurrence. A pelvic abscess can be diagnosed early with a high clinical index of suspicion and confirmed with appropriate investigations. Complex pelvic collections can originate from various sources, and establishing the exact aetiology may often be difficult. A multidisciplinary approach to holistic and patient-centred care effectively achieves good patient outcomes.

## INTRODUCTION

Pelvic abscesses are collections of pus localised within the pelvis, and they can be categorized according to their anatomical location relative to the levator ani and intraperitoneal or extraperitoneal compartments of the pelvis. These collections could arise as a sequela of previous surgery. However, they can also occur spontaneously due to inflammatory and infective causes, particularly from the gastrointestinal tract, such as diverticulitis or appendicitis, or gynaecological causes such as pelvic inflammatory disease and tubo-ovarian abscess (Bugg et al., 2016). Such causes typically accumulate in intraperitoneal pelvic recesses such as the Pouch of Douglas, but pelvic abscesses could also result from cranial extension of deep anorectal sepsis. Conversely, abscesses that result from pathology above the pelvic floor or supra-levator compartment can extend to the perineum by tracking through the intersphincteric space or extrasphincteric fistula (Oikonomou et al., 2019). Patients with these deep-seated infections present with vague symptoms and subtle signs that are typically beyond the detection of physical examination. Clinicians, therefore, need to adopt a high index of clinical suspicion for the condition, particularly in high-risk immunocompromised individuals who present septic and systemically unwell, disproportionate to their initial presentation of an apparent localised perianal abscess, as unrecognized cases may result in delayed treatment and could lead to significant morbidity and mortality. Regardless of the underlying pathology causing the formation of the pelvic collection, the priority of management is sepsis control once the patient has been adequately resuscitated. Emphasis should be placed on defining the exact location of the abscess as this provides crucial pointers to the site of the primary pathology and thus

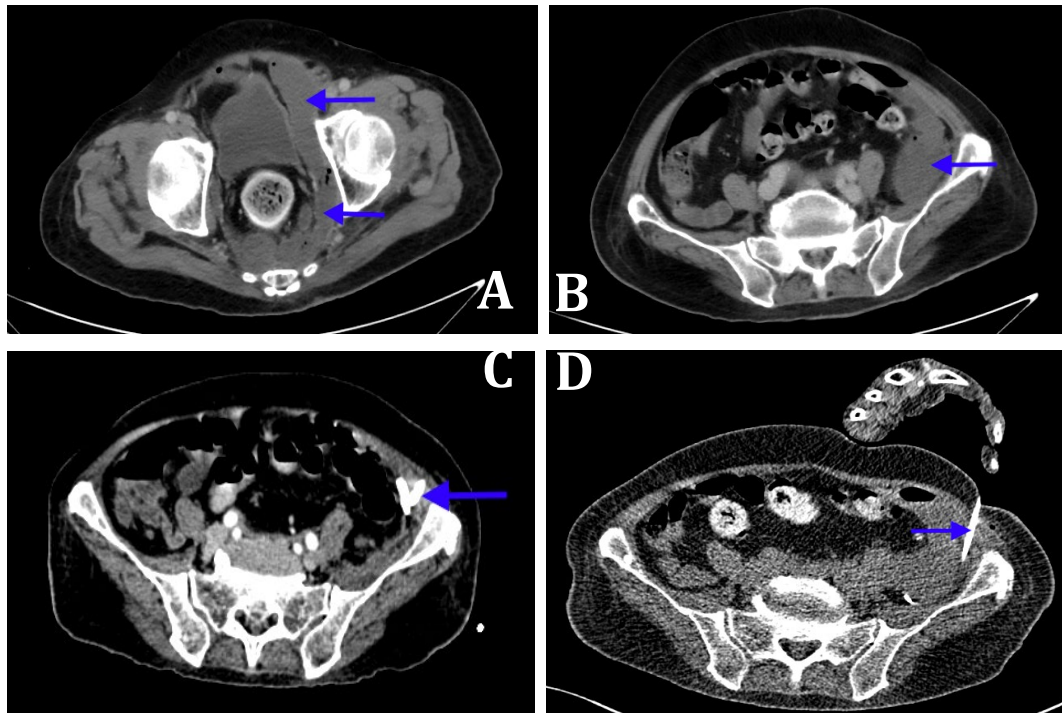
allow planning for the type of intervention and the optimal surgical approach.

## CASE PRESENTATION

We describe the clinical presentation of three patients diagnosed with pelvic abscesses managed by the colorectal team after initial admission through acute surgical services.

### Patient A

A 75-year-old gentleman without previous medical problems presented to us with perianal swelling and pain for one week. He was tachycardic and dehydrated. Perianal examination revealed a tender and swollen right perianal region with overlying soft tissue inflammation. He did not have abdominal pain or tenderness. Blood investigations revealed raised total white count (TWC) and C-reactive protein (CRP). The patient was commenced on second-generation cephalosporin antibiotics and metronidazole with analgesics in the emergency department and underwent surgical treatment in the form of incision and drainage of the perianal abscess the following day. Despite daily irrigation of the wound and dressing changes, there was persistent purulent discharge from the perianal incision. The patient was otherwise well, with normal systemic physiological parameters. With a persistently raised TWC and CRP, we suspected a pelvic collection, and this was confirmed on a contrast-enhanced Computed Tomography (CT) scan, which showed a left paracolic abscess collection with a thickened adjacent colon, as illustrated in Figure 1. There was no evidence of free intraperitoneal gas or visceral perforation. The patient underwent image-guided percutaneous drainage of the localized collection, and he was subsequently discharged from the hospital five days later with oral cephalosporin and metronidazole.

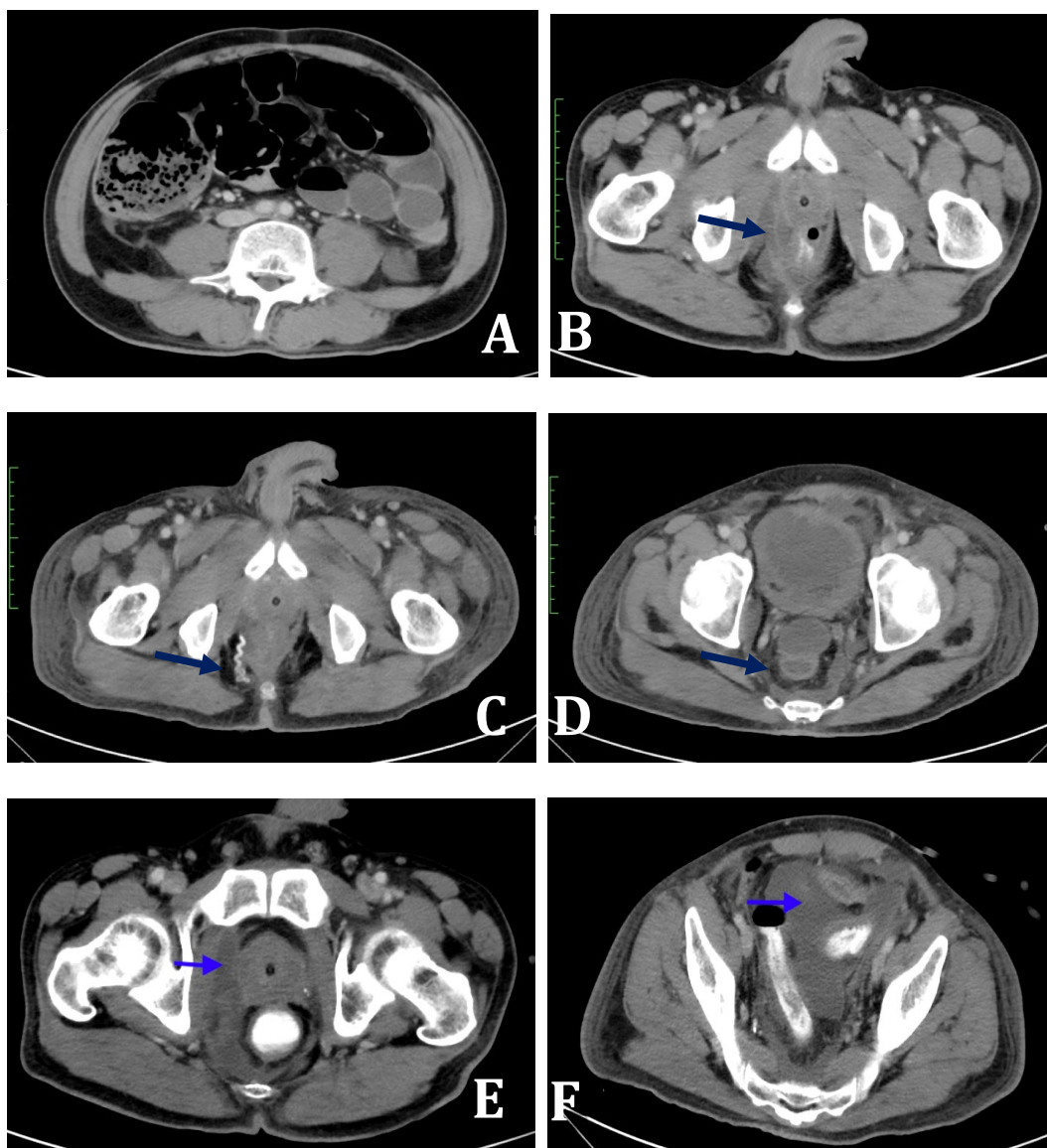


**Figure 1** Axial images of CT Abdomen and Pelvis for Patient A. CT performed after noted persistent purulent discharge from the perianal incision. Perianal abscess collection extends into the pelvis and leaves the paracolic region, as demonstrated by blue arrows (A and B). CT- guided approach to drain the intraabdominal collections (C). Resolution of collections prior to hospital discharge (D).

### Patient B

A 61-year-old gentleman presented to the Emergency Department with abdominal pain, abdominal distension, and vomiting. He was a poorly compliant insulin-dependent diabetic but was not ketoacidosis at presentation. Physical examination revealed abdominal tenderness and localized guarding over his lower abdomen. His WBC was  $13\,000 \times 10^9/L$ , and the CRP level was 25 mg/dL. A plain abdominal radiograph showed dilated bowels, and his CT scan showed dilatation of small and large bowels, with a possible transition point to suggest mechanical intestinal obstruction of the descending colon. During laparotomy, the minimal purulent fluid collection was seen in the retroperitoneal space after mobilization of the left colon. A thorough washout was performed, and a drain was inserted. After a few days in the ward, he complained of perineal pain, and upon examination, he had developed a perineal abscess collection. This was treated with open drainage under anaesthesia. Despite multiple

courses of antibiotics, he had persistent fever, abdominal pain, distension, and persistently raised inflammatory markers. A contrast-enhanced CT scan revealed a supra-levator pelvic collection that extended caudally to the perianal region (Figure 2). A second planned exploratory laparotomy was performed six weeks later, where the extraperitoneal supra-levator space was explored by dissecting through Waldeyer's fascia, and a large abscess cavity was encountered. The abscess cavity was drained, debrided, and lavaged. The patient had a stormy recovery immediately post-operative due to his deconditioned state with malnutrition, comorbidity, and labile glycaemic control due to sepsis and short-term dependence on parenteral nutrition. Through close multidisciplinary collaboration with infectious diseases specialists, intensivists, endocrinologists, dieticians, and rehabilitation services, the patient eventually made a good recovery, and he was subsequently discharged home following an inpatient hospital stay of 5 months.



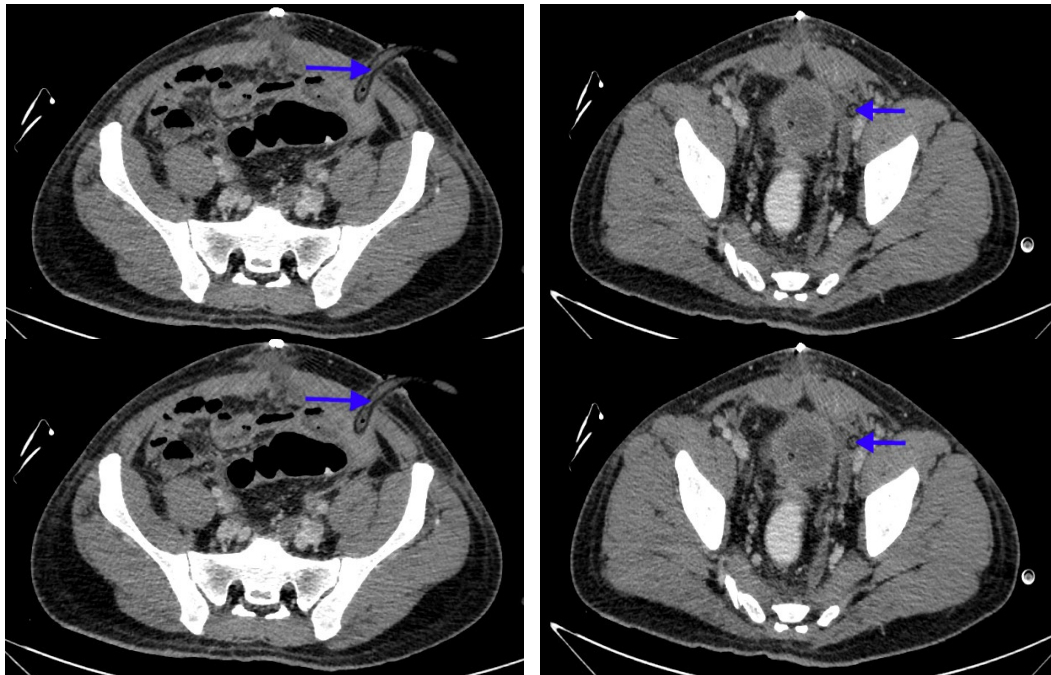
**Figure 2** Axial images of CT Abdomen and Pelvis for Patient B. CT scan done upon presentation shows generalized dilatation of small and large bowels (A) with small pelvic abscess (B). Images from repeated CT scans (note the corrugated drain after incision and drainage of the perianal abscess were performed (C) after non-resolved abdominal sepsis, which shows the increased size of the ischiorectal abscess (D+E) with extension to the pelvic cavity (F) as shown by the blue arrows.

**Patient C**

A young 32-year-old male presented with a complaint of perianal swelling for three days which was associated with high-grade fever and dysuria. Physical examination revealed tenderness and guarding of his lower abdomen. His blood tests showed a TWC of  $20\,000 \times 10^9/L$  and a CRP level of 20 mg/dL. A CT of the abdomen and pelvis was arranged as there was a clinical suspicion of an abdominal/pelvic collection, and this confirmed an extraperitoneal collection communicating with a high trans-sphincteric fistula (Figure 3). The patient was unwell with systemic sepsis despite antibiotics, and a decision was made for an exploratory laparotomy and drainage of his perianal collection during the same setting. During laparotomy, the rectovesical pouch was bulging and fluctuant. The peritoneum was incised, and pus was drained from a horseshoe-shaped cavity that extended from the space



of Retzius anteriorly to the presacral space posteriorly. The cavity lined with slough was lavaged, debrided, and a pelvic drain was inserted to prevent reaccumulation of fluid. He recovered well post-operatively and was discharged with daily dressings to his perineal wound.



**Figure 3** Images of CT Abdomen and Pelvis for Patient C. Axial (A) and coronal (B) image of CT scan during the presentation, which shows left ischiorectal abscess extending to pararectal space. Post-intervention (exploratory laparotomy and washout) as indicated by midline wound staples and drain (blue arrows) image (C+D) showing resolution of abscess before removal of drain and discharge.

### **Clinical Outcome and Follow-Up of the Patients**

All the patients in this series had repeat contrast-enhanced CT imaging to confirm the resolution or absence of pelvic collection two to three weeks following definitive treatment. All patients were discharged when they were systemically well, could tolerate an oral diet, required simple analgesics for pain control, and were self-caring. The patient demographics and their outcomes are summarized in Table 1. Patients A and B subsequently returned three months later for elective colonoscopy. Patient A was found to have diverticular disease, particularly affecting the left side of his colon. Patient B's colonoscopy was routine, and no colonic pathology could have contributed to his illness. Unfortunately, patient C defaulted on all his scheduled outpatient appointments, and he was lost to follow-up.

**Table 1** Patient demographics and summary of the three patients presenting acutely with pelvic abscess

	Patient A	Patient B	Patient C
<b>Age</b>	75	61	32
<b>Ethnicity</b>	Chinese	Malay	Indonesian
<b>Diabetes</b>	No	Yes	No
<b>Presentation</b>	Perianal swelling	Abdominal pain	Abdominal Pain and Perianal swelling
<b>Imaging</b>	CT scan after surgery	CT Scan on presentation	CT scan on presentation
<b>Management</b>	Radiologically guided percutaneous drain transabdominal Open drainage transperineal	Surgery- Open drainage of collection via a transabdominal and transperineal approach (2 days apart)	Surgery –, Open drainage of collection via a transabdominal and transperineal approach
<b>Procedure</b>	Percutaneous drainage	–	–
<b>Tuberculosis and Meleiodosis workup</b>	Negative	Negative	Negative
<b>Virology screening</b>	Negative	Negative	Negative
<b>Cultures</b>	<i>E. Coli</i> , <i>Enterococcus Faecalis</i>	<i>E. Coli</i> <i>Klebsiella Pneumoniae</i> , <i>Pseudomonas Aeruginosa</i>	<i>E. Coli</i> , <i>Klebsiella Pneumoniae</i> , <i>Enterococcus Faecalis</i>
<b>Colonoscopy</b>	Diverticular disease	Normal	Not done

Due to the patients' atypical presentations, all three patients in our series had screening tests for Mycobacterium tuberculosis in the form of the Mantoux test, chest radiograph, and three consecutive sputum Acid Fast Bacilli (AFB) cultures. All of these tests yielded negative results. The patients also consented to viral screening for HIV, Hepatitis B, and C, all of which returned negative results. Serum and purulent fluid sent for melioidosis were also negative. The microbiology profile from the pus obtained from all three patients cultured *Escherichia Coli*, whereas *Klebsiella Pneumoniae* was cultured from Patients B and C and *Enterococcus Faecalis* in patients A and C. In addition, *Pseudomonas Aeruginosa* was cultured from patient B.

At the six-month follow-up, patients A and B remained well and resumed their normal daily activities. On physical examination, all surgical wounds have completely healed. There have been no reports of symptom recurrence, and none have had subsequent inpatient readmissions. However, patient C defaulted on

all his scheduled follow-up appointments in outpatients, and consequently, we lack further follow-up data.

## DISCUSSION

The pelvic abscess is a collection of infected fluid in the pelvic cavity. It is often caused by an infection originating from the pelvic organs, but it could arise from an inflammatory process affecting adjacent structures, such as appendicitis or diverticulitis (Bugg et al., 2016). Literature has also reported pelvic abscesses arising from secondary extension from anorectal sepsis (Oikonomou et al., 2019). Therefore, it is vital to have a high level of suspicion to allow early recognition of such a condition upon a patient's presentation. Aside from the usual signs of fever and lower abdominal pain, subtle symptoms such as diarrhoea or vaginal discharge and elevated inflammatory markers should raise the suspicion of a pelvic abscess (Benigno B. B., 1981). Conversely, some patients may present innocuously with a perianal abscess

and appear clinically well, but persistent discharge, despite initial surgical drainage and raised inflammatory markers, should alert a clinician to the possibility of a concurrent pelvic abscess. Failure to identify and recognise such subtle clinical signs early may lead to high morbidity and mortality.

CT scans are invaluable in establishing a prompt radiological diagnosis and planning non-operative and operative treatment options for these patients. In addition, contrast-enhanced CT scans provide the essential roadmap to guide the best surgical approach to ensure all pre-operatively identified abscess cavities are appropriately managed intraoperatively (Salem et al., 2005). Our case series highlights the importance of paying careful attention to the surgical anatomy based on contrast-enhanced CT findings, particularly in patients B and C, where pre-operative CT guided the surgical team to explore the retroperitoneal and pelvic extraperitoneal spaces during a subsequent laparotomy to manage the pelvic collections appropriately.

The development of pelvic abscesses has been linked to the spread of cryptoglandular perianal infections in the cranial direction. This could be explained by the presence of ischio-anal fat fibres, which have been demonstrated to extend from the perianal skin to the obturator internus and levator ani at the transverse level above pubic symphysis (Zhang et al., 2017). In addition, several reports of patients re-presenting with delayed retroperitoneal collections following surgical drainage of perianal abscesses (Hanley, 1979; Zaveri et al., 1987). In our case series, all of our patients presented concurrently with pelvic and perianal abscesses, suggesting a high likelihood of the presence of an underlying fistula based on the surgical and clinical findings. However, irrespective of fistula formation, we prioritised sepsis control in our management plan for our patients, and this was achieved through thorough and careful intraoperative exploration to ensure

all collections were addressed and drained adequately. We believe that achieving sepsis control allowed spontaneous closure of any pre-existent fistulous communication.

Since infections arising from the perianal region can extend cranially, by inference, primary pelvic infections could similarly extend caudally to cause perianal collections. Fistula formation is a known complication of acute diverticulitis, and colo-vesical and colo-uterine fistula is more commonly described (Mitra et al., 2015). Colo-cutaneous fistula is very rare, accounting for about 1% of the fistulous communication arising from colonic diverticular disease. Amor et al. (2015) reported a patient with a colo-cutaneous fistula, where the patient was re-presented with a perianal abscess one month after an initial presentation with acute diverticulitis. In our case series, it is plausible that patient A, who has a left-sided colonic diverticular disease, could have developed the pelvic abscess following an acute attack of diverticulitis. However, we cannot substantiate this further, given that he had no prior hospital admissions.

Various approaches, such as transabdominal, transvaginal, transrectal, and transgluteal routes, have been described to drain pelvic collections depending upon anatomy, the complexity of the pathology, and accessibility (Robert et al., 2013). Drainage procedures commonly performed through laparotomy have been the default management for complex pelvic abscesses in the past, but of late, percutaneous image-guided drainage has been recognised as an effective treatment modality. This was exemplified by Patient A in our case series, who had a complete resolution of his pelvic abscess with image-guided percutaneous drainage. In addition, this modality is beneficial in patients unsuitable for surgical drainage due to the complexity of anatomy, patient frailty, or poor fitness for surgery (Men et al., 2002). There have also been reports of percutaneous drainage being used for immediate sepsis control as a bridge to planned semi-elective

surgery, especially in high-risk and unstable patients (Abbass et al., 2013).

Understanding the virulence and invasive characteristics of the pathogen involved is important to understand the extent of a complex pelvic abscess infection. *Adherent-invasive Escherichia Coli* (AIEC), found even in healthy colonic mucosa, can invade epithelial cells, weaken them, increase their translocation, and exacerbate their pathogenicity (Smith et al., 2013). Meanwhile, hypervirulent *Klebsiella pneumoniae* found first in Asian individuals residing as the gut pathogen is also understandably the cause of invasive abscesses. Multiple cases of tissue invasion and metastatic abscesses have also been reported (Choby et al., 2020). This may be the case in our patients as both these two organisms have been grown in their pus cultures and further highlighting the importance of isolating the pathogen to treat these complex cases successfully.

## CONCLUSION

A pelvic abscess can be diagnosed early with a high clinical index of suspicion and confirmed with appropriate investigations. However, complex pelvic collections can originate from various sources, and establishing the exact aetiology may often be tricky. Regardless of aetiology, the priority of managing such patients is sepsis control. A multidisciplinary approach to offering holistic and patient-centred care effectively achieves good patient outcomes.

## CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this article and that this study has received no financial support.

## CONSENTS

The authors have obtained approval from the colorectal unit scientific board as well as written consent from each of the patients involved to publish this case report. A copy of the written consent is available for review by the Chief Editor.

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