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Multidisciplinary approach for large retroperitoneal abscess management: A case report

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ABSTRACT

INTRODUCTION AND IMPORTANCE: Retroperitoneal abscess is a rare disease that is often difficult to diagnose and require multidisciplinary management. We report a case of large retroperitoneal abscess and the usage lumbar artery perforator (LAP) for the defect closure.

CASE PRESENTATION: A 52-year-old-women was admitted to our emergency with a chief complaint of left flank pain. Patient had history of multiple genitourinary tract procedure and diabetes mellitus type 2. We found a bulging mass on the left flank accompanied by pressure pain. A contrast CT scan revealed a large abscess on the retroperitoneal region that involved the left retroperitoneal hemiabdomen muscles. We performed multistage-treatment comprising of radical abscess debridement, followed by honey-impregnated gauze and negative pressure wound therapy for wound bed preparation. Post-debridement, the defect was closed with LAP and keystone flap. LAP flap was raised and transposed to close the defect on the caudal area. One-month follow up showed the outcome was satisfactory.

CLINICAL DISCUSSION: In our case, the source of infection was thought to origin from genitourinary infection. The history of multiple urology procedures and diabetes mellitus became the main risk factors. Multistage managements were needed to eradicate the abscess. The usage of NPWT and honey-impregnated gauze was proven successful in preparing the wound bed prior to definitive closure. Lastly, the utilization LAP flap combined with keystone flap showed satisfactory outcome for defect closure.

CONCLUSION: The management of patient with large retroperitoneal abscess require multidisciplinary approach including extensive debridement and well-prepared wound bed. In this report, LAP flap was proven reliable option to resurface large defect around flank area.

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1. Introduction

Retroperitoneal abscess is a rare disease entity. With an insidious development and lack of specific clinical manifestation, its workup may often lead to misdiagnosis. Several comorbidities are associated with the development of retroperitoneal abscess such as kidney stone, previous urological surgery, diabetes, and immunosuppression [1]. Moreover, untreated retroperitoneal abscess could lead to serious consequences and is associated with mortality rate of 20% [2]. An adequate abscess debridement and antibiotic administration is warranted.

Moreover, the removal of large abscess could create significant area of body defect which require further reconstructive surgery. One of the available options for the flap to close large defect is lumbar artery perforator (LAP) flap. Previous study by Kato reported that LAP flap provided a durable solution to lumbosacral defects

caused by oncological resection, pressure sores, trauma or infection [3].

Up to this day, there is no available study regarding the usage of lumbar artery perforator (LAP) flap in retroperitoneal abscess management. Therefore, we report the comprehensive management for patient with retroperitoneal abscess which include the diagnostic approach and defect closure using lumbar artery perforator (LAP) flap.

2. Case presentation

A 52-year-old women presented to our emergency department with chief complaint left flank pain for the past week prior to hospital admission. The pain was dull and was not affected by positional changes. The patient also presented with blistered skin around the left flank area. Referral pain, vomit and history of fever were denied. Previous history of urinary tract stone was also denied. Patient had history of diabetic ketoacidosis and was treated with two types of oral hypoglycemic medications. Moreover, patient had history of staghorn of left kidney and underwent multiple stone removal procedures which were open pyelolithotomy (2010) and extracor-

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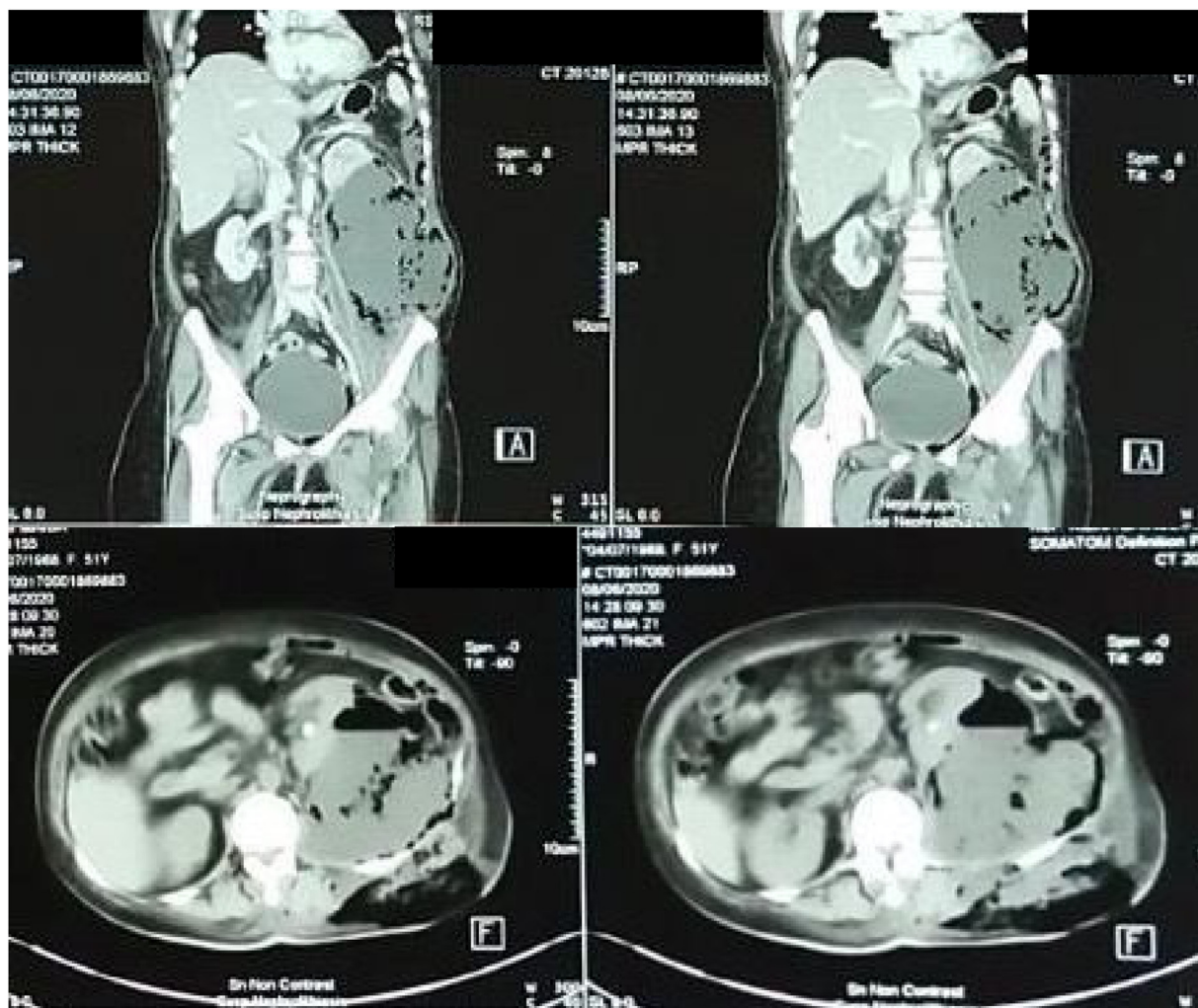


Fig. 1. Urography CT-Scan with contrast showing the presence of retroperitoneal abscess.

poreal shock wave lithotripsy (2015). It was stated that there was no residual stone observed after the second intervention. Upon physical examinations, we found a bulging mass on the left flank accompanied by pressure pain with erythematous skin.

Based on contrast CT-Scan, we found a large abscess on retroperitoneal region involving the left hemiabdomen muscles with posterior wall defect extending to cutis and subcutis of the left flank (Fig. 1). There is also pyelonephritis with kidney stone (diameter 0.9 cm) on the major calyx of left kidney. The laboratory findings revealed that the patient had leukocytosis and high blood glucose. Based on these findings, patient was diagnosed with retroperitoneal abscess, left kidney stone, and type 2 diabetes mellitus with unregulated blood glucose.

The patient's treatment process was performed in several stages and involved urology and plastic reconstructive surgery division. In the first stage, the patient underwent abscess incision drainage and debridement left peritoneal region (Fig. 2) by the urologists. Wound drainage was performed, and 700 mL of pus was extracted. The defect was closed with situational suture and drain was inserted. During postoperative follow-up, the skin became necrotic. We then decided to proceed with radical abscess debridement and proceed with negative pressure wound therapy (NPWT) for exudate removal. Postoperative defect was then regarded to be too large and direct closure could not be performed. Patient then underwent wound treatment using honey-impregnated gauze for ten days (Fig. 3.a) until wound bed was deemed viable.

After ten days of honey-impregnated gauze treatment, patient underwent re-debridement of left retroperitoneal cavity to resurface vital muscles as the wound bed. We continued NPWT for wound bed preparation prior to definitive closure (Fig. 3.c and .d). After ten days, plastic reconstructive surgery performed the defect closure with lumbar artery perforator (LAP) and keystone flap. LAP flap was raised and transposed to close the defect on the caudal area while the keystone flap was used to close the cranial area (Fig. 4).

During postoperative follow-up, there were no remarkable issues regarding overall patient condition and the flap was deemed vital (Fig. 5.a). One-month follow up revealed there was no significant complaint regarding surgical outcome (Fig. 5.b).

3. Discussion

Retroperitoneal abscess is a complicated disease with unclear symptoms due to the lack of retroperitoneal signs thus may lead to misdiagnosis. Study by Altermeier WA and Alexander JW successfully collected 189 patients with proven abscess in the retroperitoneal area [4]. The study found that the most common etiology was pyelonephritis with the main symptom being abdominal or flank pain. Further study conducted by Manjon C.C et al. in 2003 found similar results [1]. The presence of kidney stones was the main predisposing factor followed by history of previous urological surgery and diabetes. The most common chief complaint in this

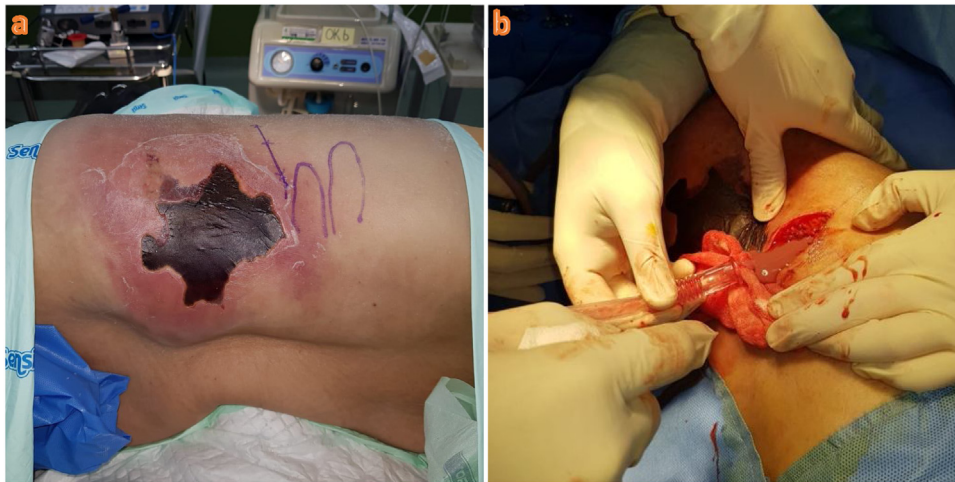


Fig. 2. Phase I intervention. a) Clinical picture of patient retroperitoneal abscess; b) Pus removal with radical debridement and suction; c) Drain placement.



Fig. 3. Phase II intervention. a) the defect after 10-days of honey-impregnated gauze treatment. b) A defect with size of 9 cm x 11 cm following secondary debridement. c) NPWT application for bed wound preparation. d) The defect after NPWT treatment.

cohort was flank pain and mass. Moreover, study by Huang S. et al. found that the origin of retroperitoneal abscess in female patient was predominated by genitourinary tract infection [5]. Based on these findings, we believe that the infection origin of our patient's retroperitoneal abscess was of genitourinary tract; pyelonephritis due to the presence of kidney stone. The presence of diabetes mellitus type 2 also contributes as the main risk factor for the development of retroperitoneal abscess.

In order to establish the diagnosis, computed tomography (CT) and magnetic resonance imaging (MRI) have proven to be reliable tools. Previous studies indicated that the sensitivities of CT and MRI were 88.5% and 100%, respectively [5]. The presence of opaque shadows or diminished psoas line is the hallmark of retroperitoneal abscess. As an alternative, sonography could be used in the aid of diagnostic process despite its low sensitivity (53.8%) [5]. In our

case, the usage of CT-Scan successfully established the presence retroperitoneal abscess.

The treatment of choice for retroperitoneal abscess are antibiotic combined with percutaneous drainage or surgical debridement [1,5,6] despite the absence of a defined protocol. A literature review by Winter et al. stated that patient with abscess size larger than 3 cm is required to receive active treatments either with surgical debridement or percutaneous drainage [7]. The study found that abscess with the size of 3–5 cm, failed previous antibiotic treatment, or patient with poor general health would benefit more from percutaneous drainage. On the other hand, if the abscess size is larger than 5 cm with low expectation of kidney function, surgical drainage is the treatment of choice [7]. In our case, the abscess was large despite normal kidney function therefore we decided to perform extensive debridement. Due to the extensive

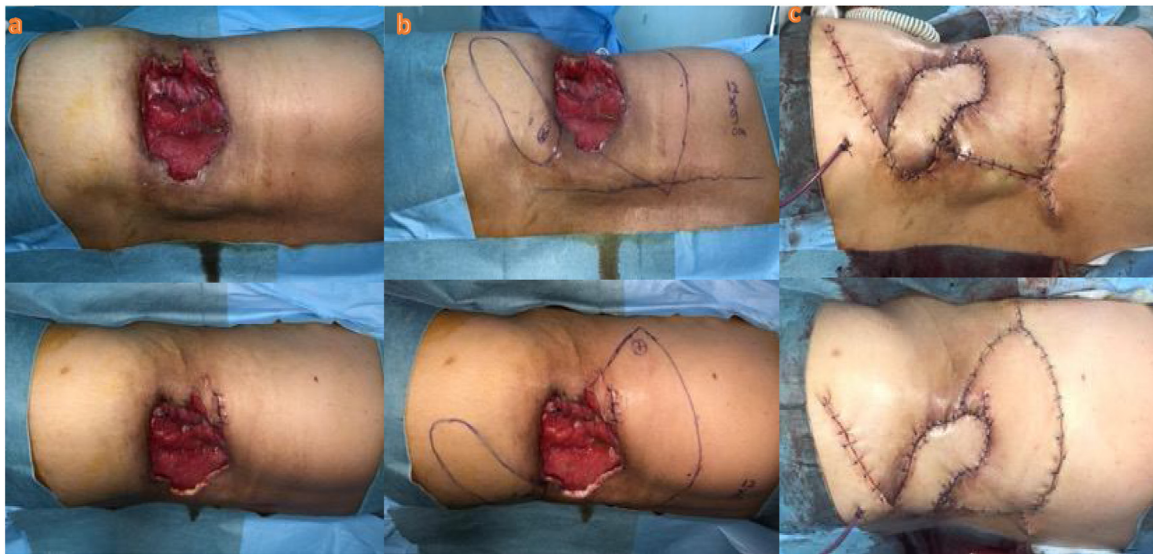


Fig. 4. Phase III intervention. a) Preoperative wound defect. b) Flap marking and donor preparation. c) LAP and Keystone flap was applied to close the defect.



Fig. 5. Follow up. a) 5-day follow up after defect closure. b) one month after the defect closure. Both showed vital flap without any sign of complications.

tissue loss following the debridement, musculocutaneous flap was needed for defect closure. To prepare the wound bed, we combined honey-impregnated gauze treatment with NPWT. The rationale of using honey gauzed treatment is based on its methylglyoxal and hydrogen peroxide feature [8]. An unpublished evidence based case report from our center found that the efficacy of honey as wound dressing is equivalent to hydrogel for treating wounds in terms of duration of wound healing [9]. Moreover, honey is a more economic and accessible option especially in a developing country such as Indonesia. The result from honey-impregnated gauze treatment in our patient also showed satisfactory outcomes.

Negative pressure therapy aids the wound management through two processes: wound contraction (macro-deformation)

and acceleration of granulation tissue formation. As a result, it will minimize the wound size and decrease its complexity [10]. A proper granulating bed would enhance the wound bed outcome for closure by either flap or graft. Further study reported by Luglio G et al. also found the usage NPWT in enterocutaneous fistulas with abdominal abscess had overall satisfactory result [11]. Based on these findings, NPWT was used to prepare the bed wound in our patient. As a result, the defect size was reduced significantly and the wound bed appeared vital (Fig. 3.d)

For defect closure, we utilized lumbar artery perforator (LAP) flap combined with keystone flap. Arco G et al. reported the usage LAP Flap for closure large defect in patient underwent exophytic exulcerated basalioma [12]. To close the defect, they used caudal

lumbar artery perforator combined with cranial lateral intercostal perforator with satisfactory outcome [12]. Moreover, recent study analyses the usage of propeller lumbar perforator flap in 32 cases lumbar defect with various etiologies [13]. The result showed that there were no coverage failure or complications at the donor site. Similarly, our patient showed a vital flap during the initial post-operative assessment. After one month follow up, the flap was in excellent condition (Fig. 5.b) and the patient is satisfied with her condition.

4. Conclusion

Based on our study, the management of patient with severe retroperitoneal abscess require a multidisciplinary approach. Contrast CT-Scan remains as the main option to establish the diagnosis of retroperitoneal abscess. Moreover, honey-impregnated gauze followed by NPWT could aid the preparation of a large defect to be closed with flap. Lastly, lumbar artery perforator flap combined with keystone design perforator island flap is a reliable option to resurface large defect around the flank area.

5. SCARE criteria

We confirmed that our work has been reported in line with the SCARE 2020 criteria [14].

Declaration of Competing Interest

The authors report no declarations of interest.

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Ethical approval

The authors declare that we obtained permission from ethics committee in our institution.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Registration of research studies

Not Applicable.

Guarantor

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CRediT authorship contribution statement

Fekhaza Alfarissi: Conceptualization, Methodology, Writing - original draft, Writing - review & editing, Visualization, Formal analysis, Investigation. **Nandita Melati Putri:** Data curation, Writing - review & editing, Project administration, Conceptualization, Methodology, Resources, Funding acquisition, Supervision. **Widi Atmoko:** Data curation, Writing - review & editing, Methodology, Resources, Supervision.

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