



## Case Report

# Surgical Management of Acute Appendicitis in a Patient with Diagnosed but “Unprepared” Pheochromocytoma: A Case Report

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### Abstract

Pheochromocytoma is a rare tumor originating from the adrenal gland, characterized by the secretion of catecholamines. Due to the risk of hypertensive crises associated with catecholamine release, surgical procedures in pheochromocytoma patients are risky. In this case report, laparoscopic appendectomy for acute appendicitis in a patient who has pheochromocytoma will be presented. A 49-year-old female patient presented with abdominal pain. Physical examination showed guarding and rebound in the right lower quadrant. The patient, who had leukocytosis in the investigations, showed signs of acute appendicitis and a 5 cm right adrenal mass on the abdominal computed tomography. A previous abdominal magnetic resonance imaging by the endocrinology department six months ago revealed a 39x32 mm mass in the right adrenal gland and elevated urinary catecholamine levels. It was learned that the patient had not attended follow-up appointments during this period. The patient was consulted by endocrinology and an emergency laparoscopic appendectomy was performed. The patient, discharged on the 2nd day after surgery, did not experience any complications. The patient was referred to endocrinology, and preoperative preparations for pheochromocytoma surgery were initiated. In cases of emergency in patients diagnosed with pheochromocytoma emergency surgery can be performed with appropriate preoperative preparation.

**Keywords:** Appendicitis, emergency surgery, hypertensive crisis, pheochromocytoma

Please cite this article as “Dincer B, Kuzu ZS, Potas RM, Arican FB, Omeroglu S. Surgical Management of Acute Appendicitis in a Patient with Diagnosed but “Unprepared” Pheochromocytoma: A Case Report. Med Bull Sisli Etfal Hosp 2024;58(4):509–512”.

Pheochromocytoma is a rare adrenal neuroendocrine tumor that can cause symptoms such as headache, sweating, tachycardia, and paroxysmal hypertension due to the secretion of catecholamines from the tumor.<sup>[1-5]</sup> Rarely, rapid and high levels of catecholamine secretion can lead to severe hypertension and associated complications, a condition referred to as hypertensive crisis.<sup>[6]</sup> In some patients with pheochromocytoma, the initial manifestation of the disease can be a hypertensive crisis, which can result in high mortality rates.<sup>[7]</sup> Manipulation of the tumor, especially during surgical

resection, can trigger these crises. To prevent hypertensive crises, medical treatments such as alpha-blockers are initiated in the preoperative period.<sup>[1,2]</sup> However, the approach to situations requiring emergency surgery in patients who have not completed preoperative preparation is controversial, with limited data in the literature. This case presentation will describe a laparoscopic appendectomy performed on a patient diagnosed with pheochromocytoma but who had not yet started preoperative preparation, following the development of acute appendicitis.

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**Submitted Date:** February 13, 2024 **Accepted Date:** April 28, 2024 **Available Online Date:** December 24, 2024

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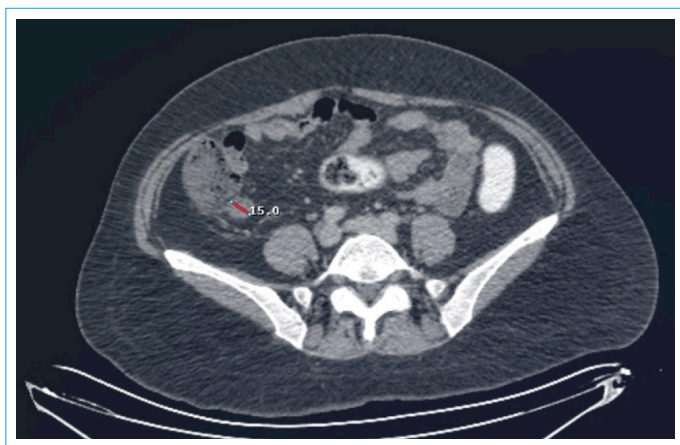


## Case Report

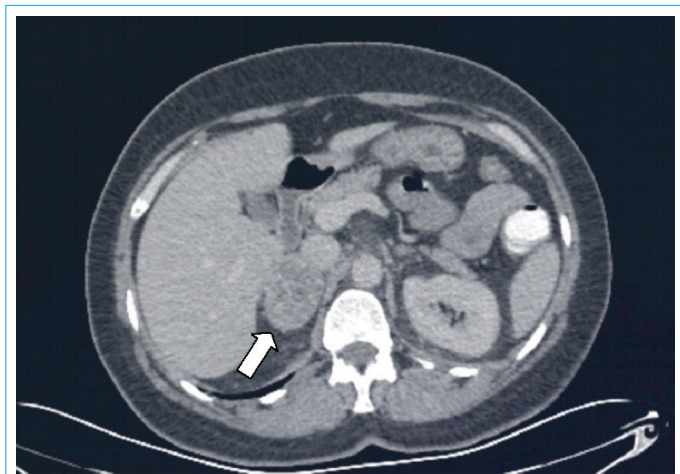
Written informed consent was taken from the patient for the case report. A 49-year-old female patient presented to the emergency department with abdominal pain that persisted for one day. Vital signs are in the normal range except for blood pressure of 160/90 mmHg. Physical examination revealed guarding and rebound in the right lower quadrant. Laboratory tests showed a white blood cell count of 26,300/mL and a CRP level of 10 mg/L. Abdominal computed tomography (CT) showed a 15 mm inflamed appendix and a 5 cm lesion in the right adrenal gland (Fig. 1, 2). The patient had history of endocrinologic assessments conducted six months ago that revealed elevated urinary levels of noradrenaline (751.5  $\mu\text{g}/24$  hours), normetanephrine (1714.6  $\mu\text{g}/24$  hours), plasma noradrenaline (5933.6 pg/mL), and plasma normetanephrine (2472.2 pg/mL). A subsequent abdominal magnetic resonance imaging (MRI) scan showed a 39x32 mm lesion in the right adrenal gland, suggestive of pheochromocytoma (Fig. 3). The patient did

not follow up with the endocrinology department after these investigations.

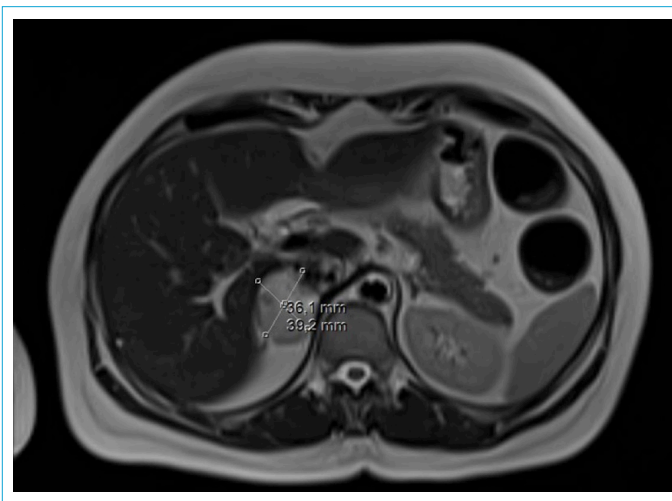
Intravenous antibiotic therapy and analgesia were initiated. The patient consulted to the endocrinology department. It was stated that emergency surgery could be performed with preoperative phentolamine IV preparation. Laparoscopic approach was planned. Appendicitis was confirmed during laparoscopic exploration (Fig. 4) and laparoscopic appendectomy was performed, lasting 25 minutes without the development of a hypertensive crisis. The postoperative course was stable, and the patient was discharged on the second day after surgery. Subsequent 10th-day follow-up revealed no complications, and preoperative preparation was started by endocrinology department. A follow-up abdominal MRI postoperatively demonstrated an increase in the size of the right adrenal lesion to 52x40 mm compared to the initial abdominal MRI (Fig. 5).



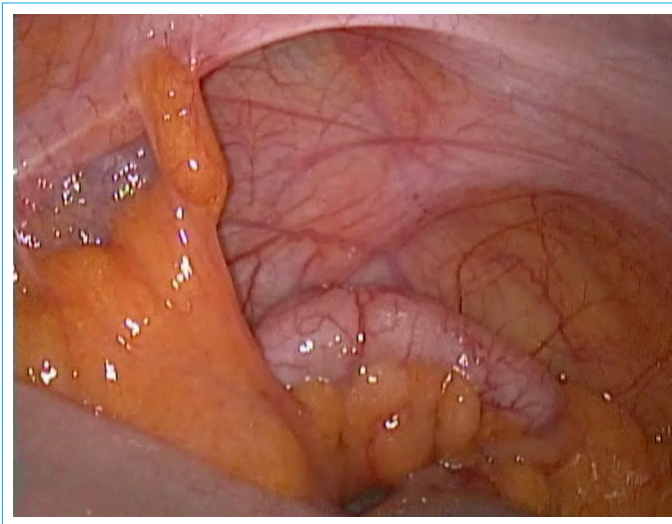
**Figure 1.** Periappendicular inflammation and 15 mm appendix.



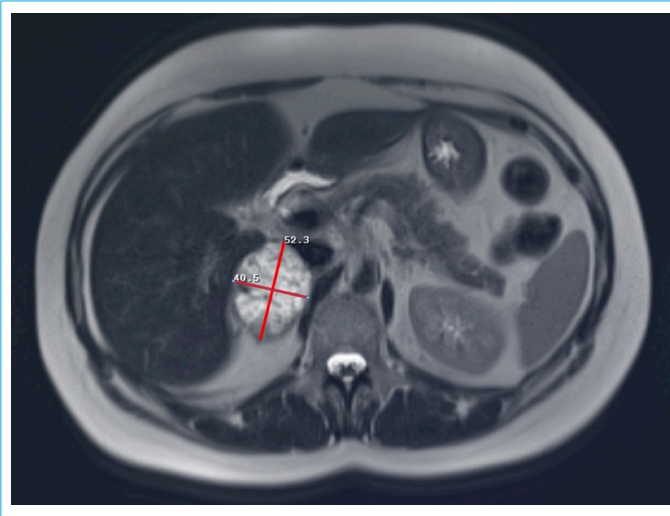
**Figure 2.** Right adrenal mass in emergency department CT scan (White arrow).



**Figure 3.** Right adrenal mass in MRI scan 6 months ago (Measured).



**Figure 4.** Laparoscopic image of appendicitis.



**Figure 5.** Right adrenal mass in post-appendectomy MRI scan (Measured).

## Discussion

Pheochromocytoma is a rare endocrine tumor that requires a multidisciplinary approach. In the literature, cases of hypertensive crises occurring during appendectomy with a diagnosis of acute appendicitis<sup>[8-10]</sup>, cases diagnosed with hypertension during pregnancy<sup>[11,12]</sup>, emergency resections due to local complications of pheochromocytoma<sup>[13,14]</sup>, and urgent surgery for spinal cord compression caused by metastatic pheochromocytoma<sup>[15]</sup> have been reported. However, the presented case is the first laparoscopic appendectomy for acute appendicitis in a patient with known resectable pheochromocytoma.

It is noteworthy that the patient did not attend follow-up appointments for approximately 6 months after being diagnosed with pheochromocytoma and presented to the hospital with acute appendicitis during this period. Patients suspected or diagnosed with pheochromocytoma should be informed about the course of the disease and the risks they may face during the preoperative period, especially hypertensive crisis, encouraging them to attend regular follow-up appointments. Moreover, in patients eligible for surgery, expediting the preoperative preparation process and performing surgical treatment as soon as possible will reduce the risk of potential urgent surgical needs during this period.

During the preoperative period, the patient was informed about the possibility of a hypertensive crisis. Knowing the likelihood of a hypertensive crisis in advance enabled the anesthesia team to be prepared for a crisis during surgery, ensuring the pre-provision of necessary medications and pre-determining actions to be taken during a potential crisis, resulting in a safer surgical process for the patient.

In a reported case of acute appendicitis where pheochromocytoma was undiagnosed, a hypertensive crisis occurred during abdominal lavage after appendectomy, and it can be suggested that an increased number and variety of manipulations may increase the risk of a hypertensive crisis.<sup>[9]</sup> Knowing the diagnosis of pheochromocytoma before surgery may contribute to avoiding unnecessary trauma and manipulation during surgery, reducing the risk of a hypertensive crisis.

## Conclusion

In patients diagnosed with pheochromocytoma, promptly initiating preoperative preparation and applying surgical treatment as soon as possible will help avoid emergencies during the preparation process and reduce the likelihood of urgent surgery during this period.

## Disclosures

**Informed consent:** Patient informed about this case report and written informed consent was taken.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** Authors declare that there is no conflict of interest.

**Financial Disclosure:** There are no grants or funding for this case report.

**Artificial Intelligence:** Artificial intelligence technologies were not utilized for this manuscript.

**Authorship Contributions:** Concept – B.D., S.O.; Design – B.D., Z.S.K., R.M.P., F.B.A., S.O.; Supervision – S.O.; Funding – B.D., S.O.; Materials – B.D., Z.S.K., R.M.P., F.B.A., S.O.; Data Collection and/or Processing – B.D., Z.S.K., R.M.P., F.B.A.; Analysis and/or Interpretation – B.D., S.O.; Literature Search – B.D., Z.S.K., R.M.P., F.B.A., S.O.; Writing Manuscript – B.D., Z.S.K., R.M.P., F.B.A., S.O.; Critical Review – B.D., S.O.

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