Myth exploded

Laparoscopic resection of a large (11 cm) adrenal pheochromocytoma

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Pheochromocytoma is a rare cause of hypertension. Usually the tumour arises in the adrenal and the only cure is surgical extirpation. Laparoscopic adrenalectomy is the gold standard. Traditionally, laparoscopic removal of adrenal tumour of more than 5–6 cm in size is contraindicated. The authors removed a 11×8 cm pheochromocytoma by laparoscopic approach without any complications. A 52-year-old male presented with complaints of throbbing headache with palpitations. On evaluation, he was found to be severely hypertensive and his blood sugar levels were moderately elevated. Radiological investigations revealed a 11×8 cm left supra renal mass. A provisional diagnosis of left pheochromocytoma was made which was strengthened by the fact that 24 hourly urine sample revealed elevated vanillylmandelic acid levels. The authors decided to surgically extirpate the adrenal mass. This was successfully accomplished by a laparoscopic transperitoneal approach. No complications were encountered. Histopathology showed pheochromocytoma of left adrenal gland without capsular involvement.

BACKGROUND

Laparoscopy since long has been established as the gold standard for removal of adrenal masses. However, several initial reports mentioned a tumour size exceeding 5–6 cm to be a contraindication for laparoscopic approach. We successfully managed a 11 cm pheochromocytoma laparoscopically. This is to underline the fact that with sufficient expertise, even adrenal tumours exceeding 10 cm may be managed by laparoscopic approach with minimal complications.

CASE PRESENTATION

A 52-year-old hindu male presented with complaints of throbbing headache with palpitations since 6 months. He had initially consulted a physician who found the patient to be severely hypertensive (blood pressure 180/100). Antihypertensive medicines were started but optimal control was not attained. The resting pulse rate was in excess of 100. His blood sugar levels were also modestly elevated (random blood sugar-160 mg%). There was no history of fever, weight loss or any disturbances in bowel

Figure 1 Contrast enhanced CT (CECT) transverse section showing left adrenal mass with central area of necrosis.

Figure 2 CECT transverse section showing left adrenal mass in relation with kidney.

Figure 3 Port placement.

or bladder habits. There was no significant medical or family history.

INVESTIGATIONS

Ultrasonography revealed a hyperechoic space-occupying lesion in the right supra renal region. A contrast enhanced CT scan showed a solid enhancing left supra renal mass of 11×8 cm size. This mass was enhancing with central areas of necrosis, adjacent fat planes were maintained. The left kidney was pushed down by the mass (figures 1 and 2). A

urine sample collected over 24 h showed elevated VMA levels.

TREATMENT

Preoperatively, the patient was started on phenoxybenzamine and the blood pressure was optimised with a daily dose of 60 mg phenoxybenzamine and 80 mg propranolol. After stabilising the patient, we decided to perform the left adrenalectomy by the laparoscopic transperitoneal approach. The patient was subjected to general anaesthesia;

Figure 4 Resected left adrenal mass measuring 11 cm in long axis.

Figure 5 Specimen cut open longitudinally.

a nasogastric tube and urethral catheter were inserted. Preoperatively, mechanical bowel preparation was done.

The patient was placed in right lateral position. Pneumoperitoneum was achieved by the closed method. We employed three ports. The first port was a 10 mm camera port inserted lateral to the left rectus above the umbilicus. Two ports were employed for hand instruments, on

the left was a 5 mm port just below the costal margin in the line of left nipple and on the right was a 10 mm port in the anterior axillary line at the level of umbilicus. The descending colon was mobilised and lienorenal ligament divided. The adrenal gland was mobilised on all sides, except laterally, with the help of harmonic scalpel. The adrenal vein was ligated by clips and divided. After lateral

Figure 6 Pheochromocytoma–Zell-ballen arrangement (low power).

mobilisation and detaching adrenal from kidney, the gland was delivered by a 5 cm incision by extending the 10 mm working port (figure 3). The specimen measured 11×8 cm and weighed 405 g (figures 4 and 5). The operating time was 200 min and total blood loss was 60–70 ml, no blood transfusion was needed.

OUTCOME AND FOLLOW-UP

Postoperatively per urethral catheter was removed and patient ambulated on the morning after surgery. Orally liquids were started on the same day. Analgesia was needed only for first two postoperative days and the day of surgery. Within 48 h both hypertension and blood sugar levels stabilised without the need for any medicines. The patient was discharged on the third postoperative day.

Histopathology showed pheochromocytoma of left adrenal gland without capsular involvement (figure 6). In the 1 year follow-up after surgery the patient continues to remain normotensive and euglycemic.

DISCUSSION

A thorough preoperative work-up is key for differentiating the various cases of hypertension and adequate preoperative treatment is paramount when indicated.¹

Laparoscopy has become the gold standard for performing adrenalectomy.² For unilateral tumours, a transperitoneal lateral approach is the most preferred because greater workspace is available secondary to gravity assisted retraction of the bowel.³ Adrenalectomy by open approach usually requires large incisions which may have to be extended into the thorax particularly for large size tumours. In this case, the adrenal tumour was of very large dimensions (11×8 cm). Laparoscopic adrenalectomy becomes progressively more difficult with the increasing size of the adrenal

tumour and is particularly difficult for adrenal masses more than 8 cm.⁴ Laparoscopic adrenalectomy for adrenal pheochromocytomas is difficult because tumours are larger and more complications are seen related to their hormonal secretions, in spite of adequate pharmacologic blockade.⁵ We were able to successfully accomplish the procedure in 200 min which is comparable to the time taken by the open approach. The blood loss was significantly less (60–70 ml), the vessels can be reliably secured with medium-large titanium clips.⁶ Since the entire procedure was carried out laparoscopically, the postoperative recovery was very smooth enabling early ambulation and restoration of oral feeds culminating in an early discharge (third day). Thus the laparoscopic adrenalectomy for tumours as large as 10 cm can be accomplished in a reasonable time frame with minimal blood loss reducing the analgesia requirement and hospital stay.^{3 7–9} The blood pressure fluctuations during laparoscopic adrenalectomy are lesser due to minimal handling of tumour.¹⁰

The same tumour if dealt with by an open approach would have certainly necessitated a thoracoabdominal incision and greater blood loss. Apart from respiratory complications this would have led to prolonged paralytic ileus and delayed ambulation with its concomitant complications and a postoperative hospital stay of 10–14 days. The large incision carries the potential of infection and chances of herniation in later life.

Previously a tumour size exceeding 5–6 cm was thought to be a contraindication for laparoscopic approach.¹¹ Several studies state a tumour size greater than 8–10 cm or preoperative suspicion of malignancy as contraindications for laparoscopic approach.^{12–14}

But several recent studies have shown that laparoscopic approach is technically feasible, safe and comparable with open approach patients with large adrenal masses.^{15–17}

Learning points

- Surgery is indicated for solid adrenal masses larger than 5 cm in diameter, masses suspected of malignancy or functional adrenal masses.
- Laparoscopy is the gold standard for performing adrenalectomy.
- Contrary to traditional belief even masses as large as 10 cm may be managed by laparoscopic approach with minimal complications.

Competing interests None.

Patient consent Obtained.

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