CASE REPORT

Simultaneous Trans-Diaphragmatic Approach for Wedge Resection of the Solitary Ipsilateral Lung Metastasis in Renal Cell Carcinoma

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Abstract About one third of newly diagnosed renal cell carcinoma (RCC) patients present with synchronous metastatic disease. Twenty to 40 % with localized disease at diagnosis eventually develop metastases. Complete metastasectomy confers five year survival rate of 35 % to 50 %. Traditional thoracic approach for lung metastasectomy carries increased morbidity. We report a less morbid trans-diaphragmatic approach. Right cytoreductive nephrectomy with liver and simultaneous trans-diaphragmatic lung resection was performed with uneventful perioperative course in a 60 year male with metastatic RCC. Trans-diaphragmatic resection of peripheral lung metastasis can be considered electively approach in selective cases of RCC with ipsilateral resectable inferior lung metastases.

Keywords Radical nephrectomy · Lung metastasis · Trans-diaphragmatic lung resection

Case History

A 60-year-old man with good performance status presented with right flank pain and recent onset weight loss and one episode of gross total painless hematuria. He was having (ECOG-0). The contrast enhanced computerised tomography (CECT) scan of abdomen revealed a right renal mass, whole of the kidney was replaced by tumor with synchronous solitary space occupying lesion (SOL) in segment 6 of the right lobe of the liver (4.3X4.1X3.8 cm), plane between liver and the tumor was not discernible. Chest X-ray revealed a coin shaped lesion in right lower zone. The high-resolution computerised tomography of the chest was done and a solitary SOL of 2 X 1.5 cm in the posterior basal segment of the right inferior lung was found. (Fig. 1) There was no evidence of lymphadenopathy and the left kidney was normal. Bone scan done was not suggestive of metastasis. We thus planned a right cyto-reductive nephrectomy with simultaneous liver and lung metastasectomy. As the tumor was large and adherent to the liver and posterior parietal wall, it was decided to do open radical nephrectomy. Procedure was performed under general anesthesia with double lung ventilation in supine position. A bolster was kept under right lower chest to maximize the surgical exposure. After performing right cytoreductive nephrectomy via anterior subcostal incision, liver resection was performed with the help of Ultracision-Harmonic scalpel device (UltraCision, Ethicon Endosurgery, Cincinnati, OH, USA). The renal tumor was stuck to the posteriolateral diaphragm, which was resected and the resultant tear was enlarged to expose the inferior posterior basal lung SOL. Lung metastasis was resected using 11 number knife after taking adequate resection margins, which were secured with 2–0 polyglactin

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Fig. 1 Chest X- Ray, right lower zone coin lesion, HRCT chest, lesion in posterior basal segment of right inferior lobe of lung, CECT abdomen, right renal mass with lesion in segment 6 of liver

suture. (Figs. 2 and 3) Diaphragm was closed with polypropylene 2–0 sutures after placing a 26 F chest tube drain. 28 F tube abdominal drain was also kept and wound was closed in layers. The total operation time was 240 min. The total blood loss was 300 ml. Patient had uneventful peri-operative course. The chest tube was removed after 48 h, when the chest radiograph revealed a well-expanded lung. He was discharged on the 5th postoperative day. The pathologic findings of the renal mass was clear cell carcinoma, Fuhrman grade III, extending into perinephric tissues and pelvicalyceal system but not beyond Gerota's fascia. The section from liver and lung lesions showed similar morphology with negative surgical margins. Patient was kept on surveillance and is doing fine till 6 months follow up.

Fig. 2 Trans-diaphragmatic approach to the right inferior lobar lung lesion

Discussion

About one third of newly diagnosed renal cell carcinoma patients present with synchronous metastatic disease. Twenty to 40 % of patients with clinically localized disease at diagnosis will eventually develop metastases. Several retrospective studies have suggested that patients undergoing complete resection of isolated metastatic focus may experience long disease-free intervals, with median overall survival rates of 35 % to 50 % in some reports. [1] In metastatic renal cell cancer, surgical management includes the cytoreductive nephrectomy with metastasectomy. But before contemplating surgery with a curative intent the staging investigations other than multiphasic abdomino-pelvic

Fig. 3 Resected specimen and cut section of right kidney with mass, liver and lung lesion

computerized tomography scan, high-resolution computerized tomography of the chest and bone scan are important for establishing resectable oligometastatic disease. Tyrosine kinase inhibitors, as an adjuvant treatment is recommended only in the presence of measurable disease after surgery.

Operative management of synchronous abdominal and thoracic pathology has traditionally used two separate incisions and are associated with high peri-operative and post-operative morbidity. Trans-diaphragmatic approach has been mainly described in literature for resection of metastatic lesion in adrenal at the time of lung resection. [2] With this approach, both lobectomy and adrenalectomy could be carried out safely and effectively with minimal morbidity. It has also been described for simultaneous resection of metastatic lesion in lung and liver from colorectal malignancies. [3] Even minimal invasive approaches have been described as combined thoracoscopic lung resection with trans-diaphragmatic adrenalectomy for adrenal metastasis. [4] Recently, left laparoscopic cytoreductive nephrectomy and trans-diaphragmatic resection of metastatic inferior solitary lung tumor has also been described. [5] In situation where open surgery is warranted and expertise for video assisted thoracoscopic resection of the lung is not readily

available, one can consider trans-diaphragmatic approach electively also to avoid morbidity of thoracic approach.

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