

# Transdiaphragmatic adrenalectomy for metastatic cervical adenocarcinoma: a technical case report

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## ABSTRACT

We present a 60-year old woman with recurrent cervical adenocarcinoma who presented with metastasis to both lungs and to her right adrenal gland. A thoracotomy was performed for resection of her pulmonary metastasis and then the right adrenal gland was excised through a trans-diaphragmatic approach. The adrenal gland resection was more complex due to involvement of the tumor with the inferior vena cava (IVC) which was repaired with a PTFE patch graft. This case demonstrates both an interesting approach to surgical resection of multiple metastases as well as a safe, although more challenging, alternative to partially resect and repair the IVC.

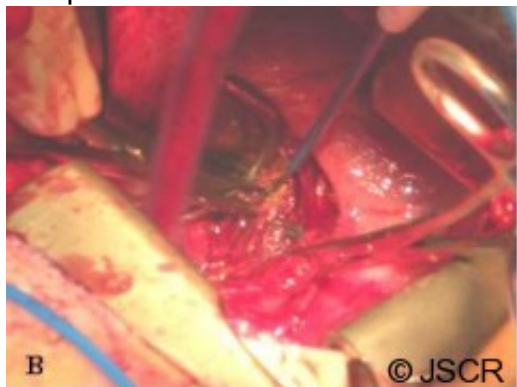
## INTRODUCTION

A 60-year-old woman is presented who required resection of both pulmonary and adrenal metastases from cervical adenocarcinoma. The patient was diagnosed with stage IA adenocarcinoma of the cervix which was treated surgically. Five years later she was diagnosed with recurrent, metastatic cervical adenocarcinoma to both lungs and her right adrenal gland. Following multiple courses of chemotherapy over the next 2-years, PET-CT imaging failed to show any advancement of her disease. Because of the stability of the metastatic disease and due to the fact that no further metastases developed, a multidisciplinary team decided to consider surgical resection of her metastases. The decision was made to perform the surgery in two stages, first, a left thoracotomy for resection of the left pulmonary nodules, followed 3 months later by a right thoracotomy and a trans-diaphragmatic right adrenalectomy.

## CASE REPORT

This case report is unique as it involves simultaneous pulmonary and adrenal resection due to metastatic cervical cancer and that the operation required partial vena caval resection due to local spread of disease. A multi-disciplinary team approach was utilized consisting of general, thoracic and vascular surgery. The second stage of the procedure was carried out through double thoracotomy incisions – a thoracotomy through the 5<sup>th</sup> intercostal space for resection of her pulmonary metastases and an additional thoracotomy through her 8<sup>th</sup> intercostal space to provide adequate exposure for retroperitoneal dissection of her right

adrenal gland. Following the wedge resections of her right lung metastases, dissection was begun to resect the right adrenal gland. A firm mass was palpable prior to incising the diaphragm, and it appeared that the adrenal metastasis had invaded the diaphragm locally. A 3cm x 3cm portion of diaphragm was incised and dissection was carried down around the liver and the adrenal mass was excised from the caudate lobe. The cancer was noted to be invading the wall of the IVC, and therefore, a vascular surgeon was consulted to assist in completion of the resection. Proximal and distal control of the IVC was obtained (Figure 1).



Following careful dissection of the posterior ligamentous attachments of the IVC to the liver, a Satinsky vascular clamp was placed and a 1 cm x 1 cm x 0.5 cm portion of the IVC was excised. The entire specimen was removed en bloc (Figure 2) consisting of diaphragm, right adrenal metastasis measuring 6 cm x 4 cm x 3 cm, a scant amount of normal adrenal tissue, the small patch of IVC and the right adrenal vein which was completely encased by tumor. A patch angioplasty of the IVC was then completed with a PTFE patch and sewn in with a running 5-0 Prolene suture (Figure 3). The diaphragm was closed primarily with pledgeted 1-0 Ethibond mattress sutures, two 28-French chest tubes were placed through separate stab incisions, and the lung was re-expanded under direct vision. The patient tolerated the procedure well and was discharged home on post-operative day 8.



## DISCUSSION

This case is unique in that it discusses a transthoracic, transdiaphragmatic adrenalectomy for metastatic cervical adenocarcinoma and partial resection of the IVC to remove the tumor en bloc. Transdiaphragmatic adrenalectomy, while not common, is not a novel idea. This was first described in 1957 by Long ET et. al.(1) Subsequently, this thoracoscopic technique has been reported in case reports, small institutional studies, and animal studies(2). Use of minimally invasive techniques in this case would not have been feasible or appropriate due to invasion of the IVC, but when certain criteria are met its use has been shown to be both safe and effective for what is otherwise considered to be a very morbid procedure. Previously, if a patient was found to have concurrent pulmonary and adrenal lesions, both thoracotomy and laparotomy incisions would be required; this approach is much less desirable due to reported success with the trans-diaphragmatic surgery. In 1998, Flores et. al.(3) described 2 cases of trans-diaphragmatic adrenalectomy with concurrent pulmonary lesions – one of which consisted of a metastatic leiomyosarcoma. Again in 2006, a case report was published describing a transdiaphragmatic adrenalectomy in patients with non-small cell lung cancer and these authors(4) and others previously(5) have theorized that due to the high frequency of lung cancer with ipsilateral adrenal metastasis a direct lymphatic connection must exist between the lung and the retroperitoneum. This would suggest that adrenal metastasis from the lung may be a “limited metastasis”(4). Furthermore, improved survival from combined resection of pulmonary and adrenal lesions in cases of lung carcinoma has also been shown(6) indicating that when this clinical situation exists simultaneous resection may be considered as a viable option. A more recent study in 2005 by Mercier et. al.(7), has also confirmed improved survival in patients with non-small cell lung cancer. A small case series out of Bnai Zion Medical Center in 1996 looking at 13 patients discussed using the transthoracic approach for removal of solitary adrenal masses irrespective of a concurrent pulmonary mass(8). Halachmi et. al. described short operative times, minimal blood loss and reduced hospital stays. This case highlights the use of a multidisciplinary team to resect simultaneous metastases to the lung and adrenal gland from cervical adenocarcinoma through one skin incision and demonstrates the possibility of accomplishing this when the tumor is locally invasive into major structures such as the IVC. Prolonged survival has been shown in small trials related to primary lung cancer with sole adrenal metastasis if both lesions are resected. Simultaneous spread of cancer to the adrenal gland and to the lung should not by itself exclude complete resection. Admittedly, the chance for curative resection in this patient is certainly smaller compared to her chances for cure at her initial resection, however, she had tolerated 2 years of extensive chemotherapy without any advancement in her metastases by our most sensitive screening methods. This report is meant to highlight the technical feasibility of the operation and not the rationale. The rationale for proceeding was made on an individual basis after multiple conversations between the patient and her surgeons.

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