

Thoracoscopic segmentectomy on ECMO to manage a second primary lung cancer in a patient with a prior left pneumonectomy

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Introduction

Second primary lung cancer management in patients who underwent prior lung resection is challenging because of the limited pulmonary reserve. In a curative intent, surgery or stereotactic radiation should be considered. Here we report the management of a pneumonectomized patient who developed a second primary lung cancer in his remaining lung.

Case report

A 57 year-old patient had a prior history of central non small cell lung cancer (NSCLC, moderately differentiated epidermoid carcinoma stage IIIB) that was managed by neoadjuvant chemotherapy, a left pneumonectomy and adjuvant mediastinal radiation therapy. He then presented three lymphadenopathy recurrences over the following three years in the posterior aortic region (lymphadenopathies) and in the retro peritoneum all managed by radiation therapy (Figure 1A-B). Six years following the pneumonectomy, the patient had no local recurrence but developed slowly growing speculated lesions in the middle lobe that were biopsied and revealed a NSCLC (epidermoid carcinoma, Figure 1C). Both lesions were active on PET-CT with no active lesions in the mediastinum or distally (Figure 1D). Brain MRI was negative. Pulmonary functions (VEMS: 79% and DLCO: 73% predicted) and the cardiovascular evaluation were normal. Multidisciplinary tumor board suggested a local treatment for the management of these lesions.

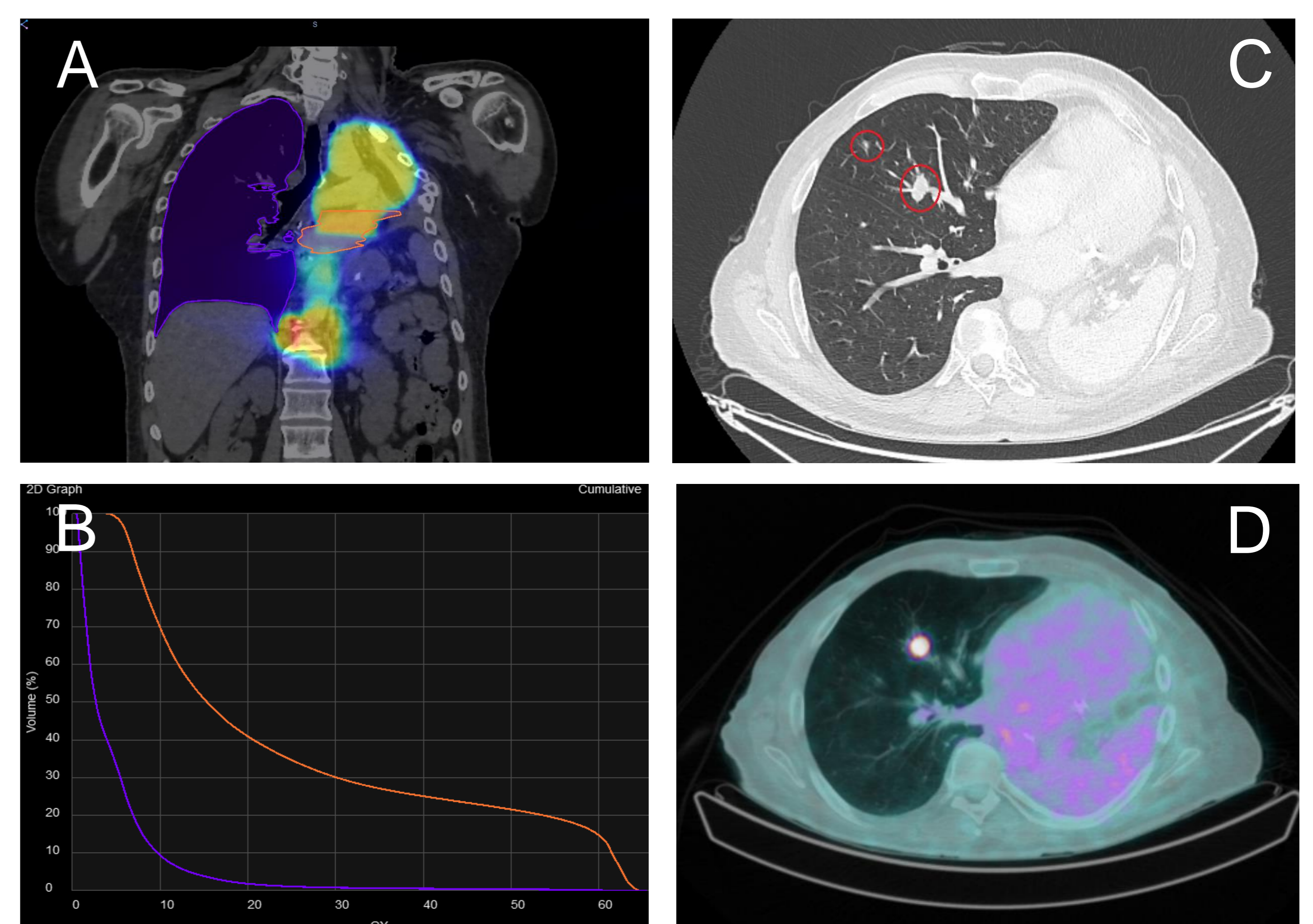


Figure 1: A-B: Cumulative dose measurement following radiation therapy with a mean dose to the heart of 25.32Gy. C: Ct-scan showing 2 speculated lesions of the lateral segment of the right middle lobe. D: Pet-Ct showing metabolic activity of both lesions

Discussion

Stereotactic radiation (based on a CyberKnife® approach) seemed possible but risky given the prior radiation dose to the heart and the high risk of single lung radiation pneumonitis (Figure 1A-B). Following a discussion with the patient and given his excellent performance status, we decided to perform a thoracoscopic middle lobe segmentectomy on VV ECMO support. A jugulo-femoral VV ECMO was placed (22F jugular and 25F femoral venous cannulas) following patient intubation (Figure 2A). At full flow (4.8L/min), patient ventilation was interrupted. A VATS lateral segmentectomy of the middle lobe was performed (Figure 2B-C). During the procedure, patient oxygenation and hemodynamics were stable. At the end of the case, VV ECMO was weaned, the patient was extubated and kept 48 hours in the ICU for surveillance. Both chest tubes were removed on POD1. The patient was discharged on POD4 and is doing well with no current recurrence. The histopathological analysis revealed two moderately differentiated epidermoid carcinomas (pT1N0L0V0Pn0R0) that were completely resected with no lymph node invasion. Our patient is currently doing well with no signs of recurrence 6 months following surgery.

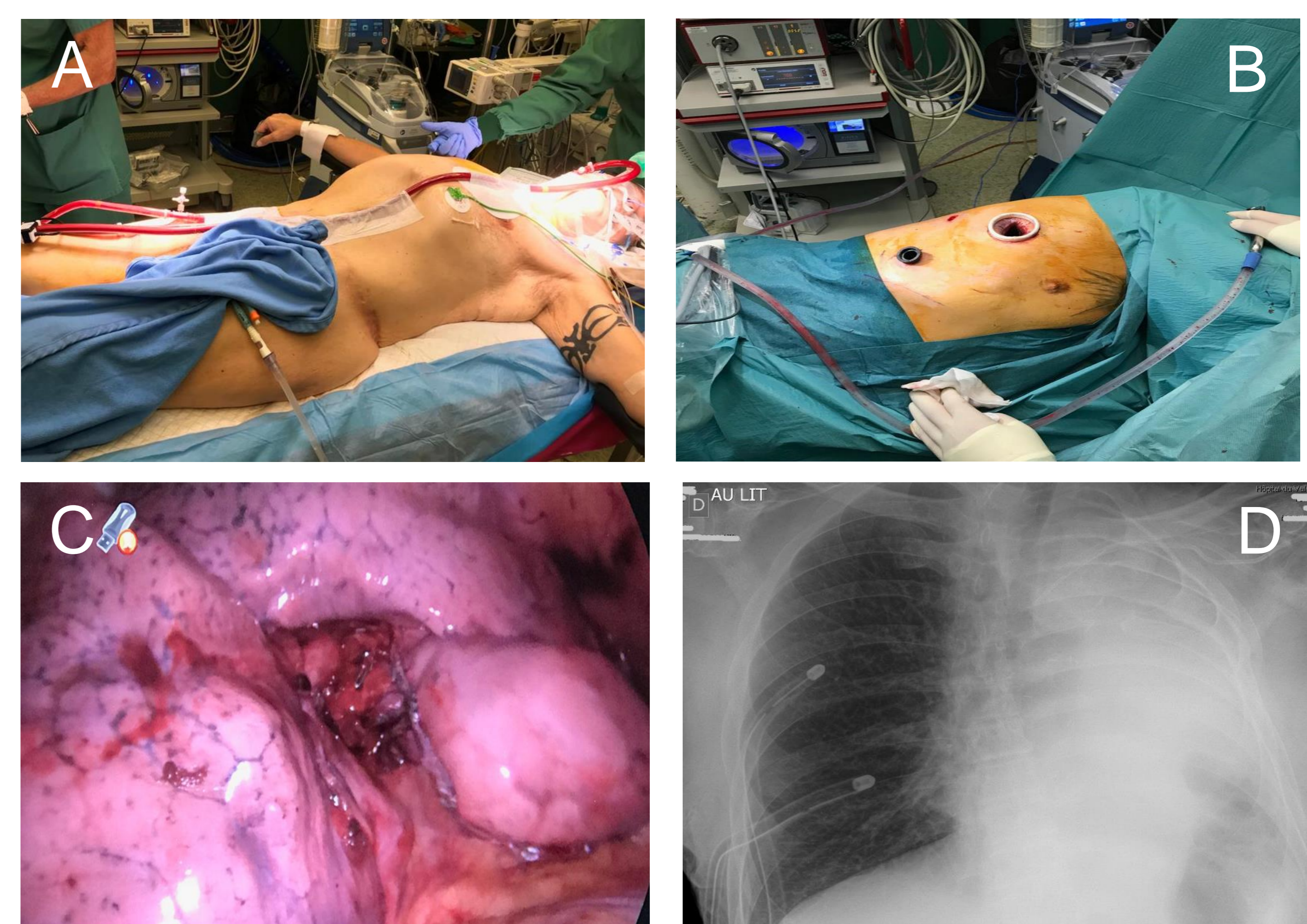


Figure 2 : A: VV ECMO setup (22F jugular and 25F femoral venous cannulas). B: VATS three port approach for middle lobe segmentectomy. C: Intra-operative vision of the middle lobe following lateral segmentectomy. D: POD1 chest X ray.

Conclusion

The management of second primary lung cancer is challenging and should be tailored to each individual case. Extracorporeal life support has allowed to push the boundaries of patient operability. In this particular case, surgery was a good alternative to stereotactic radiation therapy.