

# Pulmonary artery bleeding caused during VATS lobectomy

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VATS lobectomy is a very successful procedure with proven benefits over open lobectomy, including reduced hospital stay, reduced tube drainage and better compliance with post operative chemotherapy (1-4).

But there is a learning curve with this operation as with all complex procedures and thus surgeons must be aware of the particular complications that may face them, and the novel methods that are required to try to overcome them (5-7).

In the case presented in this video, we were performing a left upper lobectomy for a proven T1bN0M0 adenocarcinoma. The patient was 73 years old and had COPD with an FEV1 of 40%. He had undergone all routine preoperative tests including a CT Head and a mediastinoscopy to exclude N2 disease.

The video clip commences after the posterior oblique fissure has been opened up, the pulmonary artery has been dissected out and its sheath opened up and we had already dissected out and divided the lingular artery and the posterior segmental artery. The artery that we were now isolating was an anteroapical truncal artery, as in this particular patient there was not further artery after the apical segmental artery to the left upper lobe, and this artery was therefore supplying both segments.

In the video you will see that we had successfully gone round the artery with a 30 cm Roberts artery forcep. We then attempted to introduce the endo GIA stapler with a white 2.5 mm insert in order to divide this vessel. However you may also see that the angle of the stapler is not correct and it is pushing into the crux of the apicoanterior segmental artery and the main pulmonary artery. While attempting to pass the stapler round this vessel a sudden gush or dark blood is seen as the pulmonary artery is breached.

The first step is to introduce a swab mounted on a ramplays forceps. This is our first move for any significant bleeding and such a 'swab-on-a-stick' should always be available in case of significant bleeding. It should be remembered that the pressure in the pulmonary artery is often 1/3<sup>rd</sup> or less of systemic pressure and therefore pressure via the anterior working port will most often control the bleeding. We pressed on this area for 10 minutes and during that time we first cleared the area of blood and secondly as the bleeding was now controlled, we performed some further dissection in order to gain us better access to the area of the tear. This is an important point in trying to obtain control. When you have temporary control of the bleeding point, you have time to inform your staff about the event, obtain additional instruments if required, make sure that you are ready to perform a thoracotomy, ensure that blood is available, and that any additional instruments such as artery forceps are available.

We then removed the swab and as quite often occurs in these cases, the bleeding had actually stopped. This again allowed us to further mobilize around this vessel, in the hope that we might again be able to pass the stapler and obtain haemostasis endoscopically.

Unfortunately it can be seen that on investigation by the sucker, the PA started to bleed again. While using the suction to investigate this area, a ramplays forcep was placed on the left upper lobe so that bleeding could be quickly covered and pressed on, which was the case.

After this bled for a second time, the decision was made to perform a thoracotomy, but in a balanced and timely manner.

On examination there was a large tear 50% of the diameter of the segmental vessel right at the crux with the main PA.

We used a side biting clamp to resect the pulmonary artery branch, we then completed the lobectomy, and finally we placed a small bovine pericardial patch over the defect and sutured this in place with 5.0 prolene. We also covered this with coseal and the patient made an uncomplicated recovery.

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