Complicated PICC extraction due to adherent fibroblastic sleeve

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Peripherally inserted central catheter (PICC) is very convenient type of central venous access in cancer patients. PICC is used for intravenous medication administration (chemotherapy), as long as for supportive care (antibiotics, hydration and parenteral nutrition). Multiple factors can cause difficult PICC removal including thrombus formation (especially in cancer patients, who are at higher risk of trombosis) or adherent fibroblastic sleeve.

Case presentation:

- 51-year old male with metastatic oropharyngeal carcinoma (initial stage T4N3M1) with tracheostomy, requiring intravenous chemotherapy administration had his single lumen 4F PICC line placed via the right vena brachialis in august 2016. The procedure went without any complications and the catheter tip was placed in cavo-atrial junction (picture Nr.1). PICC line has been used regularly for administration of chemotherapy. Because of the risk of tumour bleeding, the patient did not receive low molecular weight heparin prophylaxis.
- After two months, in october 2016, the patient presented with upper limb swelling and pain in his right arm. Doppler ultrasonography demonstrated thrombus alongside the length of the PICC line, thrombus was also adherent to the vascular wall (picture Nr.2). This complication was succesfully treated with low molecular weight heparin in terapeutic dosage. The therapy was initiated very carefully, but no bleeding occured during the treatment.
- The PICC line was placed for 16 months and was fully functional the whole time.
- After completion of the treatment, in december 2017 (14 months from the diagnosis of trombosis), the planned extraction procedure was initiated. After the external fixation removal, we tried to extract the catheter carefully. But the line could not be pulled out more than 5 cm. X-ray showed the tip of catheter still positioned close to the cavoatrial junction (picture Nr.3).
- PICC could not be removed by standard technique. Because of the risk of vascular damage (superior vena cava dissection) with extensive bleeding in patient treated with profylactic dose of low molecular weight heparin, we preferred the cooperation with an interventional cardiologist. Using fluoroscopy, we introduced the guiding wire into the lumen of the catheter and slowly and cautiously removed the catheter without damaging the integrity of the PICC line and without vascular damage (picture Nr.4).

Discussion: The pathologist evaluated the tip of the PICC catheter and found a fibroblastic sleeve mixed with plateles (picture Nr.5). We supposed the fibroblastic sleeve was adherent to the endothelium. The cause of this was probably the trombosis and the time from catheter insertion (more than one year). There is a question - does the longer time from implantation influence the adherence of PICC tip to the endotel?

Literature:

Kuter DL, Thrombotic Complications of Central Venous Catheters in Cancer Patients. The Oncologist April 2004 vol. 9no. 2 207-216
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Picture Nr.1: Location of the catheter tip in cavo-atrial junction

Picture Nr.2: Doppler ultrasonography demonstrated thrombus alongside the length of the PICC line, thrombus was also adherent to the vascular wall. Lumen of v.axillaris and v.subclavia were stenotised by the trombus up to 80%

Picture Nr.3: X-ray shows the tip of catheter (after the extraction attempt) still positioned close to the cavoatrial junction

Picture Nr.4a: Using fluoroscopy, we introduced the guiding wire into the lumen of the catheter. 4b-c: The interventional cardiologist slowly and cautiously removed the catheter without damaging the integrity of the PICC line and without vascular damage.

Picture Nr.5: Fibroblastic sleeve mixed with platelets surrounding the catheter (photo from the pathology department)