

# PORTAL CATHETER TRANSECTION DUE TO PINCH-OFF SYNDROME

## ABSTRACT

We present a 59-year-old male patient with descending colon cancer undergoing chemotherapy via a portal catheter in the right subclavian vein. During the third chemotherapy session, he presented with erythema, edema, and mild pain in the chest region. A chest X-ray revealed complete transection of the catheter at the costoclavicular level, consistent with costoclavicular pinch-off syndrome. The device was removed, and the embolized fragment was retrieved endovascularly via the femoral route without complications. Subsequently, a new catheter was implanted via the right internal jugular vein. Pinch-off syndrome is a rare mechanical complication of subclavian access that can lead to catheter fracture and embolization, requiring timely diagnosis and treatment.

**Keywords:** *pinch-off syndrome; catheter transection; central venous access.*

## Author

Marcelo Frosch<sup>1</sup> , Facundo Arreguez Sosa<sup>2</sup> , Juan Esteban Paolini<sup>1</sup> 

<sup>1</sup>Cardiovascular surgeon.

<sup>2</sup>Medical resident in Cardiovascular Surgery.

Vascular Surgery Department,  
Hospital Dr. Julio Méndez,  
Autonomous City of Buenos Aires,  
Argentina.

## Corresponding author:

Marcelo Frosch  
[marcelofrosch@gmail.com](mailto:marcelofrosch@gmail.com)

## INTRODUCTION

Pinch-off syndrome (POS) is a rare mechanical complication of central venous catheters implanted via the subclavian route, caused by repetitive compression of the catheter between the clavicle and the first rib. This compression can lead to progressive deformation, structural deterioration, and, in advanced cases, complete catheter transection with intravascular embolization of the distal fragment. Its reported incidence is low, at 0.8-1%, yet it can cause serious complications, including cardiac arrhythmias, pulmonary embolism, infections, and loss of central venous access. Diagnosis is based on clinical suspicion in the setting of device dysfunction and is confirmed by radiologic studies; a chest X-ray is the initial imaging modality of choice. Once catheter transection is established, treatment consists of early removal of the reservoir and, when possible, endovascular retrieval of the embolized fragment. Given the low incidence of this complication and the importance of timely recognition, we present the following clinical case of pinch-off syndrome with complete transection of a portal catheter, resolved through surgical removal and endovascular retrieval of the distal fragment.

## CLINICAL CASE

We present the case of a 59-year-old male patient with a history of descending colon cancer undergoing chemotherapy, who had a portal catheter placed in the right subclavian vein under ultrasound guidance and fluoroscopic control for this treatment (*Figure 1*).

After two chemotherapy sessions, at the start of the third session, he presented for an outpatient consultation due to erythema and edema, with mild discomfort upon moving the ipsilateral arm.

On physical examination, the symptoms were confirmed, and catheter dysfunction with leakage of chemotherapy into the right pectoral region was suspected. A chest X-ray was immediately ordered, which revealed complete sectioning of the catheter at the costoclavicular space (*Figure 2*).

The surgical approach was determined on an on-call basis. The device was removed, and the catheter rupture was confirmed (*Figure 3*). The remaining catheter was retrieved endovascularly via a femoral access using a snare, without complications (*Figures 4-6*).

One month later, following consultation with the Oncology Department regarding the continuation of his treatment, it was decided to implant a new portal catheter via the right jugular vein (*Figure 7*).

POS is described as the rupture of a catheter placed in the subclavian vein due to intermittent

compression between the first rib and the clavicle. It is a rare mechanical complication, with an incidence rate of 0.86%. Peak incidence is observed 6 months after implantation.<sup>1</sup> The most common sites of catheter embolization are the pulmonary artery (35%), the right atrium (27.6%), the right ventricle (22%), and the superior vena cava (15.4%). Characteristic symptoms include chest pain, difficulty or pain during chemotherapy infusion, intermittent resistance to the passage of solutions, edema in the anterior chest region, and a history of difficult implantation.<sup>2</sup> Complications include arrhythmias, pulmonary embolism, and endocarditis. POS is classified into different grades based on its stage of progression:<sup>3</sup>

- Grade 0: no catheter deformation.
- Grade 1: no catheter deformation, but with catheter deviation.
- Grade 2: with deformation of the catheter lumen.
- Grade 3: catheter transection.

Treatment of POS consists of surgical removal of the catheter as soon as possible. Removal of the distal catheter fragment that has embolized into the right heart chambers or pulmonary arteries is recommended to avoid serious complications. The method of choice for its removal is endovascular, via the femoral vein using a snare catheter. When this option is unsuccessful, percutaneous access via the internal jugular vein may be attempted, and, as a last resort, a surgical approach with a median sternotomy.

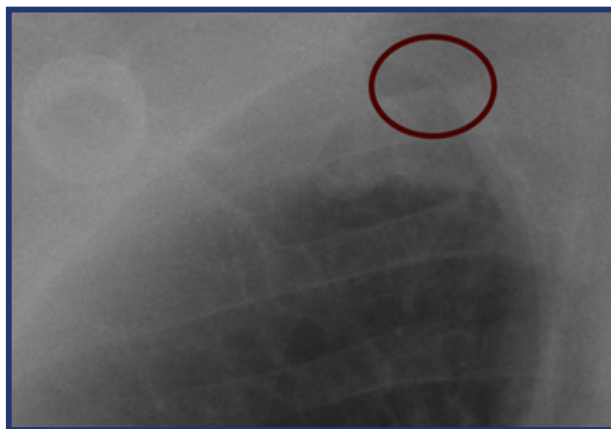
To prevent POS, it is recommended to cannulate at the lateral aspect of the midclavicular line during subclavian venous access, perform the procedure with precision, avoid forced upper-limb positions, closely monitor patients after implantation, and remove the venous port immediately when it is no longer needed.<sup>4</sup>

## Declaration

The authors declare no conflicts of interest.



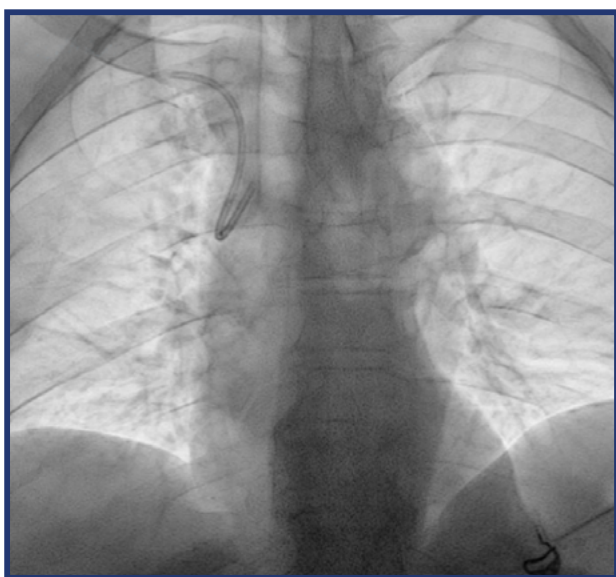
**FIGURE 1.** Right subclavian portal catheter implantation on the day of the procedure; correct positioning is observed.



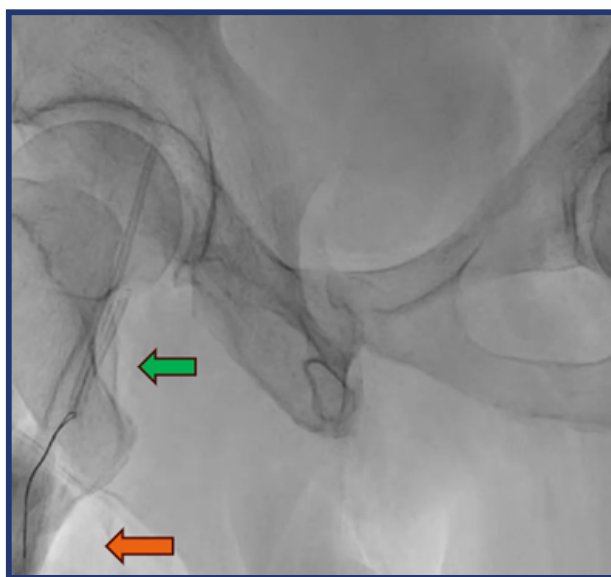
**FIGURE 2.** Chest X-ray. The section of the portal catheter is visible.



**FIGURE 3.** Removed catheter: the distal section is confirmed.



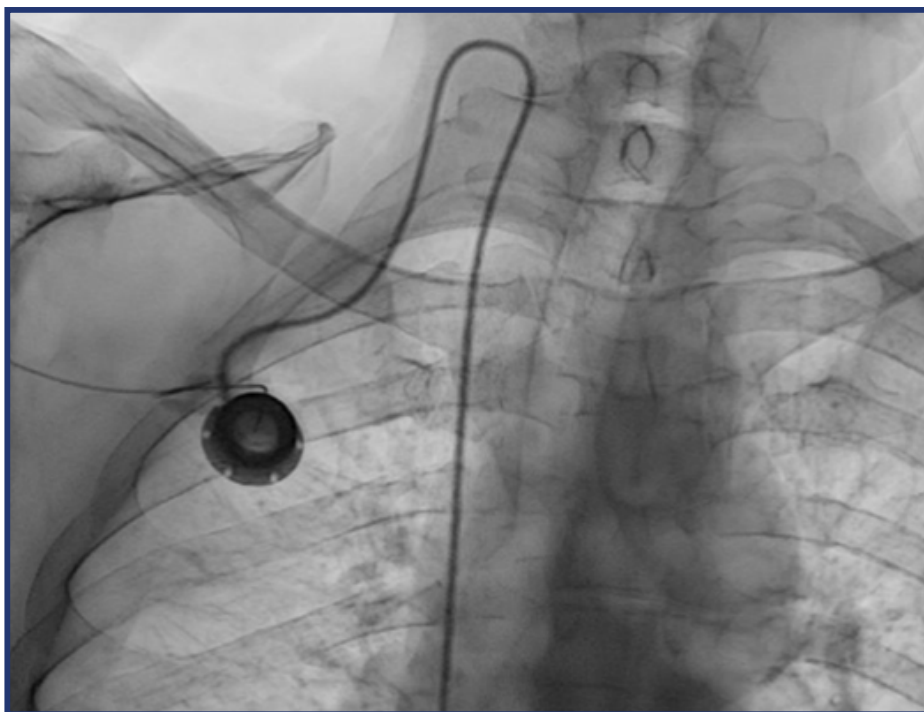
**FIGURE 4.** Distal remnant of the catheter lodged in the superior vena cava.



**FIGURE 5.** Removal of the remaining catheter. Green arrow: distal end of the catheter. Orange arrow: looped catheter.



**FIGURE 6.** Distal catheter remnant after removal.



**FIGURE 7.** Portal catheter implanted via the right jugular vein.

## REFERENCES

1. Eizaga R, García Palacios MV, Pernia A, Torres Morera LM. Port-a-Cath partial rupture in a low-grade pinch-off syndrome. *Rev Esp Anesthesiol Reanim (Engl Ed)*. 2018;65(7):419-420. doi: 10.1016/j.redar.2017.10.003
2. Morales-Victorino N, Damas de los Santos F, Kuri-Ayache M, López-Aguilar C. Pinch-off syndrome. Case report and review of the literature. *Gac Med Mex*. 2015;151(4):529-532.
3. Wu CF, Ko PJ, Wu CY, Liu YH, Kao TC, Yu SY, Li HJ, Hsieh HC. A single-center study of vascular access sites for intravenous ports. *Surg Today*. 2014;44(4):723-731. doi:10.1007/s00595-013-0610-9.
4. Moist LM. How Can the Complications of Central Vein Catheters Be Reduced?: Treating and Preventing Catheter Malfunction. *Semin Dial*. 2016;29(3):199-200.