

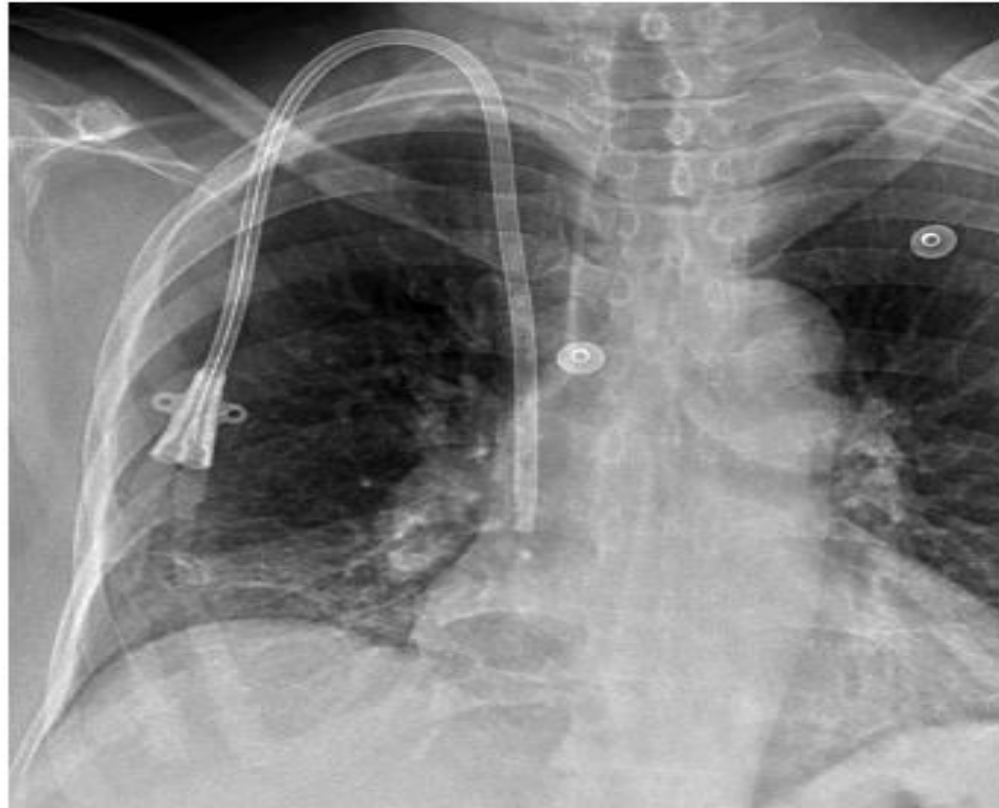
# Permcath occlusion

# Extraluminal

- ▶ Kinked
- ▶ Fibrin Sheath
- ▶ Malposition
- ▶ Structural destroyed

# Correct

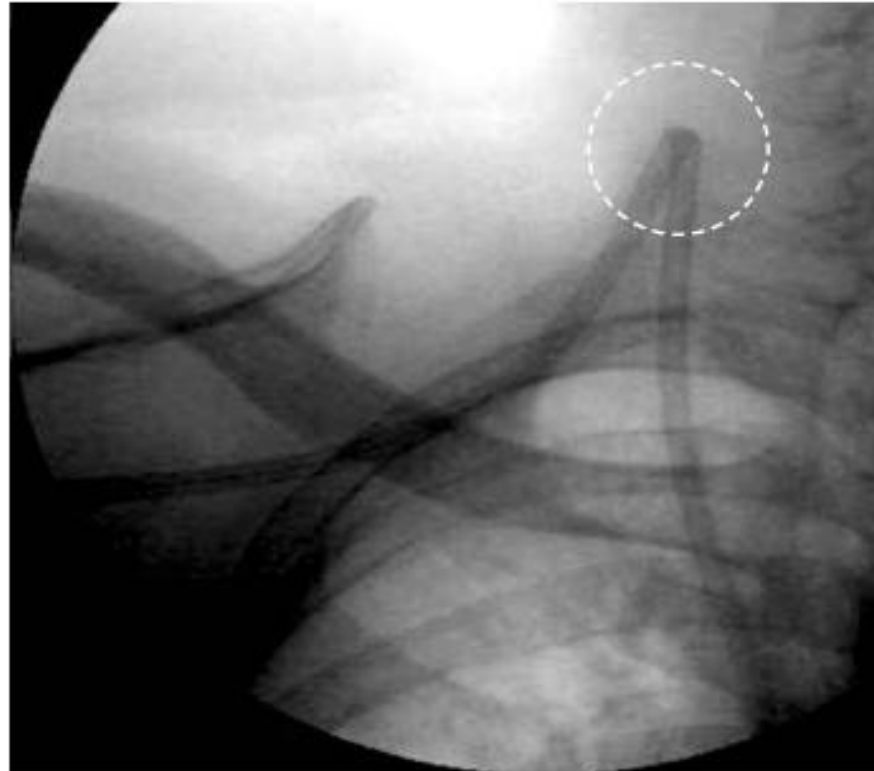
The catheter is placed in the right internal jugular vein with a smooth curve in the subcutaneous tunnel. The tip of the catheter is placed in the right atrium to achieve adequate blood flow during hemodialysis.



# Kinked

## Kinked Catheter

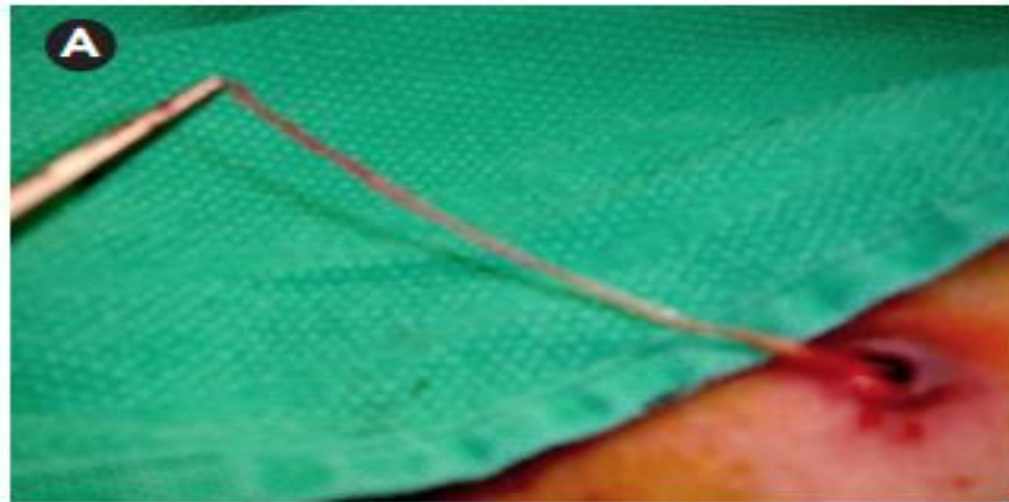
The catheter in the subcutaneous tunnel is acutely kinked causing mechanical obstruction to the blood flow.



# Fibrin sheath

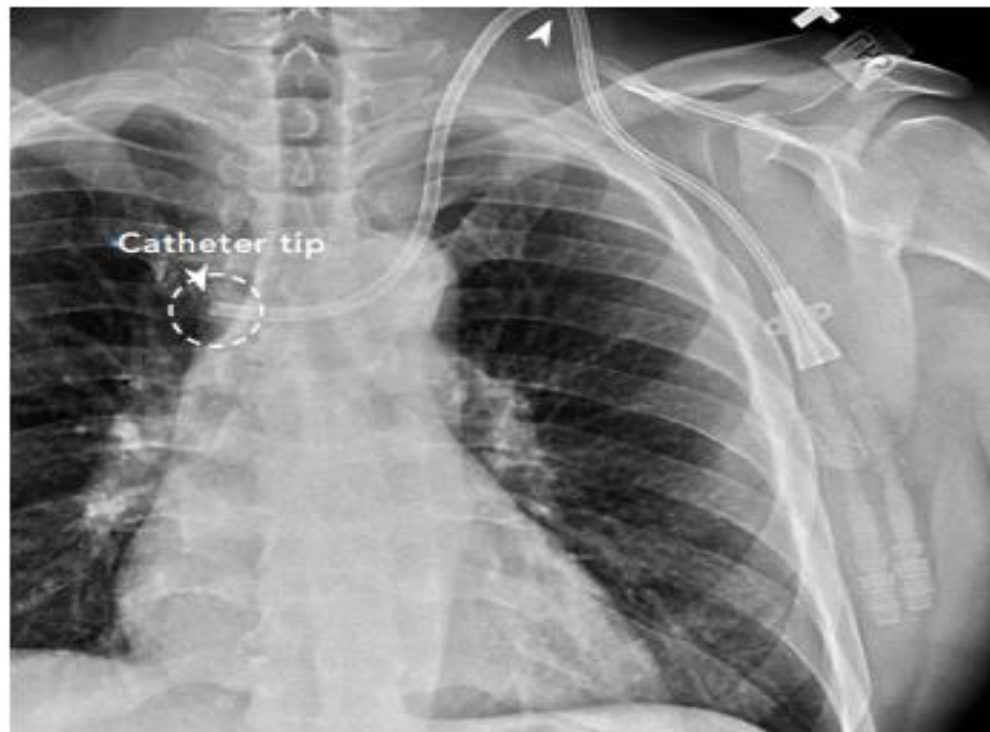
## Fibrin sheath

An intact fibrin sheath pulled out along with the catheter. A fibrin sheath is a flimsy fibroepithelial tissue that extends from the cuff (A) to the tip of the catheter (B).



# Malposition

## Malpositioned Tip of Catheter



Left internal jugular catheter with kink in the subcutaneous tunnel (arrow). The tip is placed in the left innominate (brachiocephalic) vein.

The catheter is unlikely to provide adequate blood flows for dialysis.

# Structural destroyed



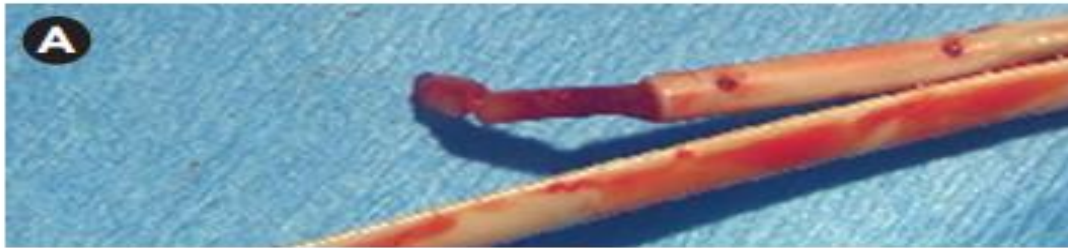
# Intraluminal

- ▶ Intraluminal thrombus



# Intraluminal thrombus

## Intraluminal Thrombus



Fibrin sheath extending beyond the tip of the catheter and occluding it completely.



An organized thrombus occluding the tip of the catheter.



The organized clot has been extruded from the catheter.

# Treatment

- ▶ Kinking correction
- ▶ Strip the fibrin sheath
- ▶ Malposition correction
- ▶ Intraluminal infusion of fibrinolytic
- ▶ Replacement of catheter