

Brief clinical history:

Arterial puncture for blood gas analysis is a common procedure in emergency departments. Cannulation of an artery line is required in critically ill patients in the emergency room, and should be a basic skill for emergency physicians (EP). Its main indications include hemodynamic monitoring in critically ill patients and arterial blood gas analysis. Like any invasive procedure, it has a risk of complications, according to the literature, it can be very variable, ranging from 5%-19%, amongst those risks are infections, thrombosis, injury of the vessels, etc... Predisposing factors are advanced age, coagulation disorders or use of anticoagulants/antiplatelet agents.

Misleading elements:

In here, we present the case of a 72-year-old man who developed a radial artery pseudoaneurysm after performed an arterial puncture for blood gas analysis.

Helpful details:

A man of 79 years, with hypertension, chronic atrial fibrillation on anticoagulation and chronic obstructive pulmonary disease (COPD), was admitted in the context of COPD exacerbation. He was in poor general condition, tachypneic, tachycardic, sweaty and underwent an arterial blood gas analysis. Hours later the patient presented a large swelling in the wrist, so another colleague trained in point of care ultrasound (POCUS), performed an ultrasound scan showing a large pseudoaneurysm that depended on the radial artery, which was lap-permeable and non-thrombosed.

Helpful details:

The patient was submitted to surgical removal of the false aneurysm and direct arteriography, uneventfully.

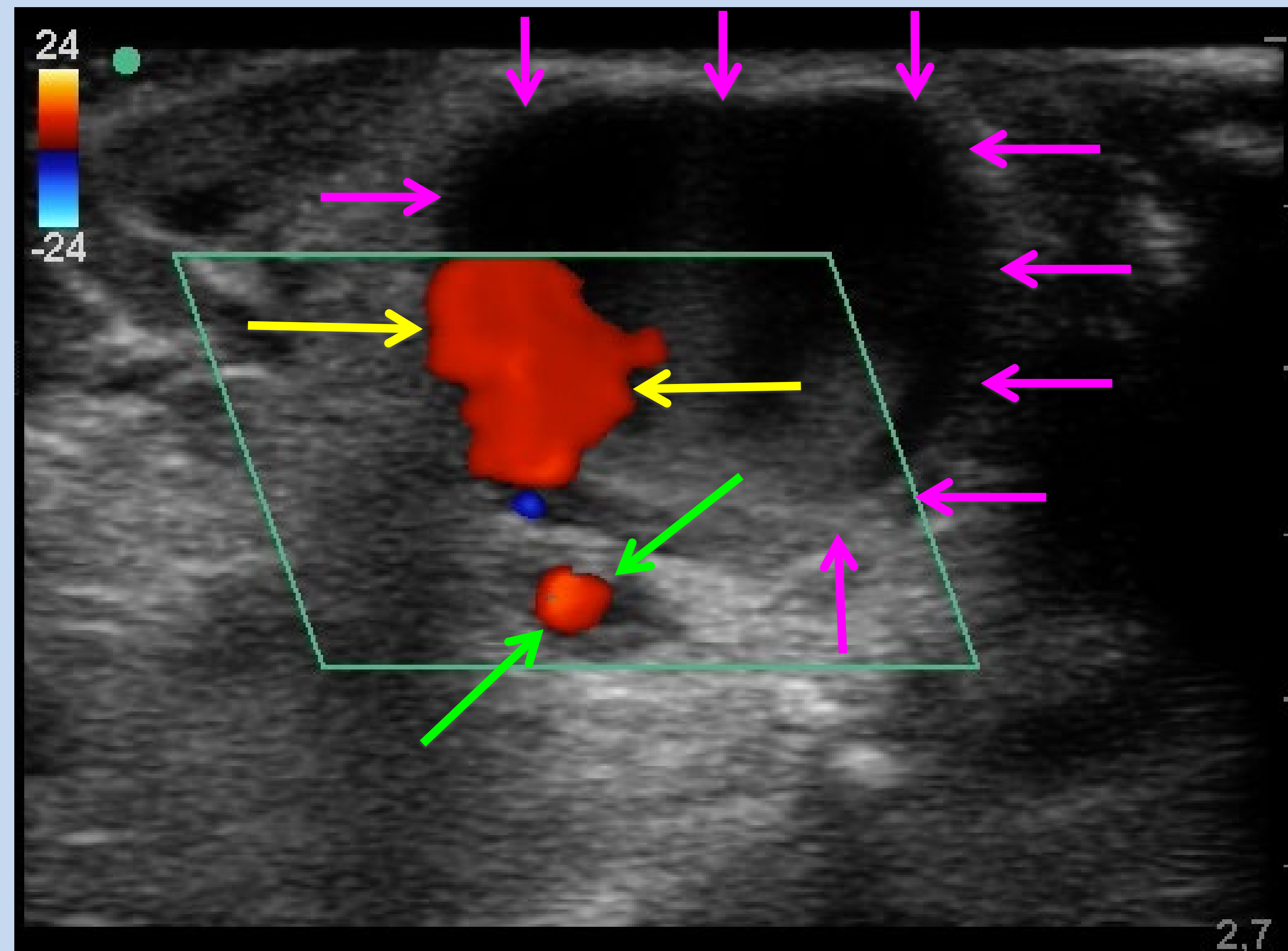


Figure 1: A transverse view of wrist. **Green arrows:** a transversal view of the radial artery. **Yellow arrows:** arterial jet, from the radial artery, inside the pseudoaneurysm (**pink arrows**).

Differential and actual diagnosis:

A pseudoaneurysm is most often recognized by the presence of a pulsatile mass with a systolic bruit over the catheter insertion site; it can be confirmed by ultrasonography. Almost all pseudoaneurysms occur within the first three days after removal of the artery sheath, and most of the remaining cases by seven days after sheath removal. The main risk factor for pseudoaneurysm formation is an inadequate period of manual compression.

Educational and/or clinical relevance:

Pseudoaneurysm of the radial artery is extremely rare, in PubMed research, there were about nine cases of iatrogenic radial pseudoaneurysm reported between 2006 and 2016. The vast majority of cases are due to iatrogenic arterial lesions and their incidence has been increasing because of the higher use of interventional radiological procedures. It usually occurs secondary to trauma, interventional procedures, and infections. Symptoms occur due to mass effect by the pseudoaneurysm, digital ischemia, or nerve suppression. B-mode and color Doppler ultrasonography are the first choice in diagnosis. The pathognomonic ultrasound sign of pseudoaneurysm is the turbulent flow, called the "ying-yang" sign. Bandages, ultrasound probe compression, ultrasound-guided thrombin injection, covered stents, and surgical ligation can be used in treatment.

The use of ultrasound guidance for arterial cannulation is now supported by significant evidence and it is easily accessible by using ultrasound. We would like to conclude highlighting that ultrasound-guided arterial cannulation appears to be a safe and effective alternative in patients with predisposing factors of suffering a pseudoaneurysm. Therefore, we believe that all emergency physicians should be trained in the management of POCUS, as well as in ultrasound-guided techniques.