

**Case Report***Open Access, Volume 2***Ultrasound guided femoral artery cannulation:  
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**Case report**

Some meta-analyses have shown the broad benefits of the ultrasound visualization for arterial cannulation, such as the increases of the first-attempt success rate, mean attempts, mean-time, and reduction of hematoma incidence. The advantages over the palpation technique, promote the inclusion of ultrasound guide as part of the recommendation for arterial cannulation [1].

The arterial access in the pediatric and neonatal population represents a challenge in the anesthesia and critical care scenarios. The small diameter of the vessels and some pathological disorders require new strategies for successful process improvement [2].

Invasive monitoring, blood samples collection in multiple scenarios as the emergency department, operation room, critical care, and hemodynamic laboratory necessitate the use of femoral artery lines. Even though complications remain infrequent (3.5%), these can be severe (10.5%), sometimes require surgical intervention and blood transfusion (6.4%), as well as increase the mortality (4.7%) [3].

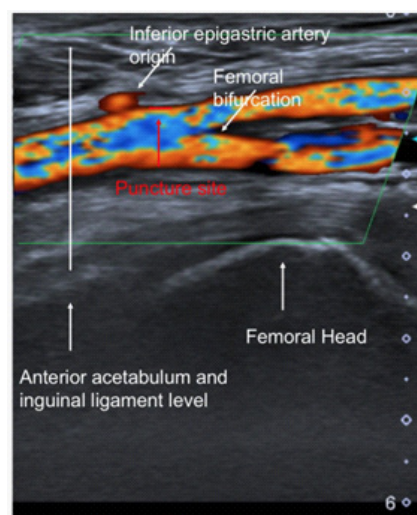
We recommend ultrasound-guided cannulation of the femoral artery always to reduce the risk of complications. A too distal puncture of the femoral artery, at the femoral bifurcation, could cause an anterior wall lesion and predisposes to the formation of pseudoaneurysms. This consideration is particularly critical

in obese and edematous patients in which the inguinal crease is caudally displaced. On the other hand, a very high puncture of the femoral artery, above the inguinal ligament, predisposes the risk of retroperitoneal hematoma and hidden hemorrhage in a noncompressible zone, a rare but life-threatening complication. This circumstance is more frequent when the artery's posterior wall has inadvertently trespassed in an anticoagulated patient. This situation can be avoided using ultrasound that allows the permanent visualization of the needle and the puncture of only the anterior wall. We recommend using the femoral head as a landmark of the safe zone for ultrasound-guided puncture. In a sagittal oblique view, the femoral artery is anterior to the femoral head's superomedial edge. In this position, the bifurcation is seen as inferior, preventing a too distal puncture [4,5]. The anterior border of the acetabulum and pelvic ring superior and are the landmarks for the inguinal ligament, avoiding very proximal access. Identifying the origin of the inferior epigastric artery is critical to prevent its injury with the risk of a pseudoaneurysm. Sometimes the space for puncture is limited, as is shown in the image (Figure 1).

This safe zone has another advantage, when the vascular sheath or catheter is removed, the artery is compressed efficiently over a posterior hard and bony surface. All these advantages also apply to infants and children. Interventional radiologists described this concept for fluoroscopic guidance, but it can be extrapolated to the ultrasound guidance. Therefore, we propose using the femoral head as an ultrasound reference to be used in adult and pediatric patients to reduce complications and improve patient safety.

## References

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**Figure 1:** Sagittal oblique view of the "Safe Zone" showing the femoral artery, anterior acetabulum, femoral head, epigastric artery origin and femoral bifurcation, and the optimal puncture site.