Antegrade Superficial Femoral Artery versus Common Femoral Artery Punctures for Infrainguinal Occlusive Disease

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ABSTRACT

Purpose: To compare the outcomes of planned superficial femoral artery (SFA) and common femoral artery (CFA) antegrade punctures in patients undergoing endovascular interventions for infrainguinal occlusive arterial disease in a single center.

Materials and Methods: Between August 2010 and July 2011, consecutive patients who underwent antegrade puncture of CFA or SFA for infrainguinal occlusive disease were studied. Data including sheath size, rate of closure device usage, and complications relating to the arterial puncture were classified according to Society of Interventional Radiology (SIR) classification and analyzed retrospectively.

Results: There were 199 antegrade arterial punctures, of which 28 (14%) were planned SFA punctures, performed in 184 patients. All patients had ultrasound-guided puncture. The sheath size ranged from 4 F to 8 F. In 2 of 28 (7%) SFA punctures, a closure device was deployed compared with 43 of 171 (25%) CFA punctures. Six bleeding complications were noted in the CFA puncture group (6 of 171 [3.5%]), of which 2 required urgent operations (repair of a pseudoaneurysm and evacuation of retroperitoneal hematoma). In comparison, only one minor groin hematoma was noted in the SFA puncture group; this did not require any further treatment. No thromboembolic complications were associated with SFA puncture.

Conclusions: Planned antegrade SFA puncture under ultrasound guidance can be performed safely in selected cases with no added morbidity. Interventionalists should have a low threshold for considering antegrade SFA puncture as a first-line access site, especially in patients with a hostile groin.

ABBREVIATIONS

CFA = common femoral artery, PFA = profunda femoris artery, SFA = superficial femoral artery

Traditionally, preferred antegrade arterial access for catheter angiography of the lower limb involves puncture of the CFA. Barriers to this access include obesity and groin scarring from previous surgery or angiography. A high femoral artery bifurcation may result in inadvertent puncture of the profunda femoris artery (PFA). On many occasions, antegrade CFA puncture results in a guide wire passage into the PFA with subsequent difficulty in manipulating the guide wire into the SFA (1,2). In such circumstances, there is increased risk of complications—hence an alternative access site is attractive, without having to consider using a contralateral approach.

Antegrade SFA access has the advantage of directly entering the target artery, avoiding adverse areas (obesity, scarred groins, or diseased sections of the artery) and repeated punctures and saving time (2). However, the threshold for using the SFA as the access site is high because of the perceived higher incidence of complications compared with CFA (3,4). The aim of this study was to evaluate and compare the outcomes of planned SFA and CFA antegrade arterial puncture in patients undergoing endovascular interventions for infrainguinal occlusive arterial disease.

MATERIALS AND METHODS

Approval from the institutional review board was obtained for this retrospective study. Between August 2010 and July

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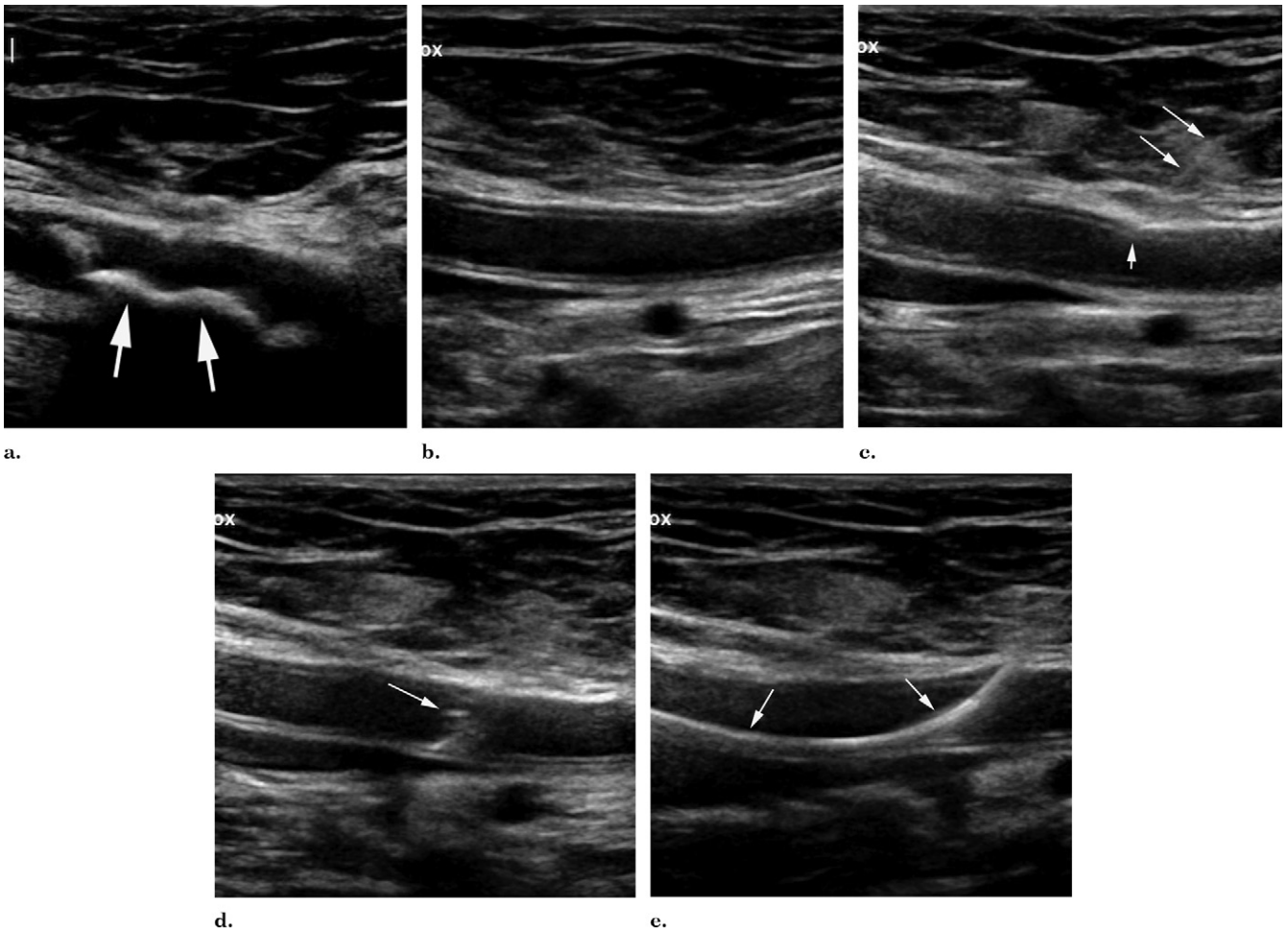

Figure 1. Ultrasound-guided direct antegrade puncture of the SFA. **(a)** Longitudinal image of the CFA. Note the calcified posterior plaque (arrows). **(b)** Longitudinal image of the proximal SFA. The artery is much healthier with normal arterial wall layers seen. **(c)** Ultrasound-guided antegrade SFA puncture. Note the needle in the subcutaneous tissues (long arrows) indenting the arterial wall (short arrow). **(d)** The needle tip has been advanced into the vessel lumen (arrow). **(e)** A guide wire has been advanced (arrows).

2011, 184 consecutive patients underwent diagnostic or therapeutic angiography of the lower limbs in a single center. Patients undergoing antegrade puncture of the CFA or SFA for infrainguinal occlusive arterial disease were included. Exclusion criteria included retrograde puncture, antegrade puncture for treatment of aneurysmal disease, and graft stenosis. Ultrasound was routinely used, and an adequate segment of artery for puncture was chosen with the ability to target a vessel of sufficient caliber and to avoid specific areas of disease (**Fig 1**a–e). Data on the site of puncture, sheath size, use of a closure device, and complications relating to arterial puncture were collected and graded according to Society of Interventional Radiology (SIR) classification for complications by outcome (5).

RESULTS

Between August 2010 and July 2011, 184 patients with a mean age of 74.0 years (range, 47–93 y) underwent 199 antegrade punctures for infrainguinal occlusive disease at

Table 1. Demographic and Clinical Data of Superior Femoral Artery and Common Femoral Artery Puncture

	CFA	SFA
Mean age (y)	74.8	68.3
Sheath size (F)		
4	48 (28%)	9 (32%)
5	108 (63%)	17 (61%)
6	13 (8%)	2 (7%)
7	1 (0.5%)	0
8	1 (0.5%)	0
Site of intervention		
Above knee	129 (78%)	20 (74%)
Below knee	37 (22%)	7 (26%)
Type of closure device used		
Mynx	40	2
Starclose	2	0
Angioseal	1	0
Platelet (10^9/L)	264.73	233.64
INR	1.00	1.01

CFA = common femoral artery, INR = international normalized ratio, SFA = superficial femoral artery.