

# Outcome of vascular complications after arterial punctures



## Introduction :-

Arterial catheterizations are used routinely for continuous haemodynamic monitoring in the operating room and also in critically ill patients <sup>(1)</sup>. It provides easy and appropriate access for several blood samplings and blood gas analysis <sup>(2)</sup> and has frequently been found to be a safe procedure, with a few severe complications <sup>(3, 4)</sup>. Percutaneous arterial cannulation is used widely in the clinical management of critically ill adults second in frequency to intravenous cannulation <sup>(5)</sup>. Common sites of percutaneous needle puncture include the radial, femoral, brachial, dorsalispedis, or axillary artery. There is no evidence that any site is superior to the others. However, the radial artery is used most frequently due to its easy palpability, low complication rates, location and patients comfortability than the other sites. Patients undergoing radial or dorsalispedis artery puncture should have the collateral flow to those vessels evaluated prior to puncture, to avoid the risk of ischemic complications <sup>(6, 7)</sup>. Each arterial catheterization site is associated with a unique set of potential complications. Radial artery insertion is associated with peripheral neuropathy, femoral artery insertion with retroperitoneal hematoma, axillary artery insertion with brachial plexopathy, and brachial artery insertion with injury to the median nerve <sup>(8)</sup>. Although many sites share the same possible complications (eg, bleeding), the frequency of these complications varies among the different insertion sites. The most common complications associated with radial artery catheterization are occlusion (2 to 35 percent) and hematoma (up to 15 percent) <sup>(9)</sup>. Permanent injury usually results from either complication.

Frequent temporary occlusion of artery has been identified as one of the main complications of radial arterial cannulation ( 10, 11) . Arterial complications have serious ischemic damage to the hand after radial artery cannulation which lead to necrosis and amputation of fingers or the whole hand. ( 12 ) . Femoral artery is the another commonest site of arterial cannulation in intensive care units ( 13 ) .

The femoral artery is usually preferred than the radial artery because the it is usually palpable even in hypotensive shock patients and is the only available route for haemodynamic monitoring ( 14 ) . The incidence of related complications in the femoral artery is much lower than that in the radial artery and can be recognized easily because of the larger vessel diameter ( 15 ) . Chances of sepsis is more in femoral artery cannulation because of the proximity of perianal region ( 16 ) . The most common complication associated with femoral artery catheterization is hematoma (6%), which can be larger and difficult to detect if extends to the retroperitoneum ( 17 ) . The third most dangerous site of arterial cannulation is axillary artery and it is preferred to be uncannulated because of its close proximity to carotid artery and may compromise cerebral circulation ( 18 ) . Axillary artery cannulation is technically difficult, although pulsation and pressure are maintained even with peripheral vascular collapse where as femoral artery cannulation is less difficult, can be cannulated, even during profound hypotension (24) . Arterial catheter infections of 10 -20% are complicated by local (eg, insertion site) infection, and 5 % by bacteremia or sepsis ( 11 ) .

It is generally known that arterial puncture related complications are common in ICU. The purpose of this prospective analysis was to evaluate the nature and outcome of vascular complications following arterial punctures in intensive care units of King Abdulaziz Medical City.

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