

# Vascular Access during Cardio Pulmonary Resuscitation(CPR)

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## ABSTRACT

**Introduction :** During a situation involving CPR peripheral venous access is the route of choice to administer drugs. If peripheral access is poor, intra osseous route is recommended, but in countries/ hospitals where this equipment is not available other potential routes need to be explored to ensure fast drug delivery.

**Case Report :** It is assumed that during cardiac arrest and ongoing CPR ; insertion of a central venous catheter and arterial line requires the interruption of CPR and can be technically challenging and associated with complications, but in certain situations and with adequate skilled manpower, this might turn out to be very helpful. We discuss a similar case here where central venous catheter and arterial line was inserted during CPR and further discuss the pros and cons of invasive access during such situations.

**Conclusion :** This case highlights, how in certain situations, central venous and invasive arterial access can play a potentially important adjuvant role and can act as a life saving measure for the patient.

**Keywords:** vascular access, cardio pulmonary resuscitation (CPR)

## INTRODUCTION

During a cardiac arrest the focus of clinicians is to provide an uninterrupted and high quality CPR. In cases where peripheral vascular access is difficult, intra-osseous route is recommended for administration of drugs over obtaining central venous access.<sup>1</sup> Arterial line catheterization during cardiac arrest is again not done commonly and the benefit that it may provide against risks such as infection ,needle stick injury etc. is a topic still to be explored.

## CASE REPORT

A 60 year old male was admitted to emergency with cardiac arrest. After confirming absence of pulse CPR was started as per guidelines. Peripheral venous access was poor and multiple attempts failed. The equipment for intra-osseous access was not available and hence decision was made to insert central venous catheter into femoral vein without interrupting CPR. After palpation of femoral pulse a puncture was made medial to this location using the landmark technique. The catheter was inserted uneventfully in first attempt. Position was confirmed as appropriate by doing blood gases from the catheter as well as a femoral arterial stab and also by transduced waveform from the catheter. This was used to administer drugs and fluids. Subsequently using the palpatory method and landmark technique femoral arterial line was also placed and transduced which gave a visual representation of the blood pressure.

## DISCUSSION

It is assumed that during cardiac arrest and ongoing CPR ; insertion of a central venous catheter and arterial line requires the interruption of CPR and can be technically challenging and associated with complications, but in certain situations and with adequate skilled manpower, this might turn out to be very helpful. The central venous route has some unique advantages, as compared to the peripheral venous route or the intra-osseous route, higher peak drug concentrations are achieved with the central venous route, that is to say drug circulation time is shorter.<sup>2,3</sup>

During CPR palpating for carotid pulse with the index and middle fingers has been the standard for hundreds of years but even this has some pitfalls. Some patients with a cardiac output do not have a palpable pulse either because their blood pressure is too low; their body habitus makes it difficult to find the pulse, or because the providers finger tips are not sensitive enough. Additionally, the presence of gloves can make finger sensation even more dulled. Also providers may feel a pulse when one isn't there. Typically, this occurs when a provider presses down hard over the vessel and confuses their own digital pulse for that of the patients. Finally each of us has a different quality of sensation in our fingertips.

Pierpont et al observed that in addition to providing continuous pressure monitoring and ready access to arterial blood samples, direct feedback from the intra-arterial pressure waveform frequently led to improved compression technique by the resuscitator performing external cardiac massage.<sup>4</sup> For patients who are potential candidates for Extra corporeal membrane oxygenation [ECMO], central vascular access obtained during CPR can reduce the time for initiation onto ECMO and these catheters provide a conduit for an easy conversion to ECMO cannulae.

## CONCLUSION

Although central vascular access and intra-arterial monitoring is not recommended routinely during CPR; in certain scenarios discussed above, this has a potentially important adjuvant role and can act as a life saving measure for the patient.

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