

Bilateral Pink Pulseless Hand as a Result of Brachial Artery Catheterisation

Brakial Arter Kateterizasyonu Sonucu Oluşan Bilateral Pembe Nabızsız El

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ABSTRACT

In emergency services, Intravenous catheters are most useful instruments to hydrate patients, administrate drugs fast and get serial blood sample with a single invasive procedure emergency departments. Accidentally, the venous catheters may be introduced into arteries ending up with pulseless hands. Following up pink pulseness hands is an important concept to rescue the extremity. The presented case is a 3-days old infant with no trauma history to the upper extremities but showing up with bilateral, pink, pulseless hand secondary to accidental arterial vascular injury during venous catheterization. Pink pulseness hand treatment is still controversial in the literature. In pink pulseness hand cases where close monitoring can be applied, good results are obtained without surgical exploration.

Keywords: Bilateral brachial artery, Pulseless pink hand, Catheterization

ÖZ

İntravenöz kateterler acil servislere hastaları hidrate etmek, hızlı ilaç uygulamak ve tek bir invaziv işlem ile seri kan örneği almak için en kullanışlı araçlardır. Venöz kateterler kazara artere uygulanabilmektedir ve bu durum klinikte nabızsız el tablosuna neden olabilmektedir. Pembe nabızsız elin takibi ekstremitayı kurtarmak için çok önemli bir prosedürdür. Sunmuş olduğumuz vaka üst ekstremitelerde herhangi bir travma öyküsü olmayan, ancak venöz kateterizasyon sırasında kaza ile arteriyel vasküler yaralanmaya sekonder gelişen bilateral pembe nabızsız el ile başvuran 3 günlük infanttır. Pembe nabızsız el tedavisi hala literatürde tartışmalıdır. Yakın izlem uygulanabilen pembe nabızsız el olgularında yakın takip uygulanabilir ve cerrahi eksplorasyon olmadan iyi sonuçlar elde edilebilmektedir.

Anahtar kelimeler: Bilateral brakial arter, pembe nabızsız el, Kateterizasyon

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The increase in recent years of intra-arterial invasive interventions has caused an increase in vasospasms seen in mid-diameter arteries such as the brachial artery. Kuttner and Baruch first published a review of their experience of this phenomenon in 1920, observed as spasms in the main arteries in the proximal of injuries in extremities with bullet wounds from the 1914-18 war [1]. In that review, the authors stated that despite the vessels are structurally sound during surgical intervention, they observed total spasm and interrupted blood flow [1]. In 1935, Montgomery and Ireland described similar spasms seen in the brachial artery related to trauma in children with a supracondylar fracture [2]. In a study of dogs by Mustard and Simmons in 1953, it was stated that tension in the arteries resulted in spasm [3]. Treatment of children with findings of ischaemia in the hand has traditionally been related to the degree of spasm. In the literature, pink, pulseless hand in the paediatric age group is seen in the majority primarily as a complication related to Gartland Type 3 supracondylar humerus fracture [4-9].

Here, we would like to present a 3-days old infant with no trauma to the upper extremities who was applied with venous catheters in bilateral antecubital fossa for follow-up, where both catheters accidentally entered brachial artery resulting in bilateral, pink, pulseless hand.

CASE REPORT

A 3-days old infant was transferred to our Emergency Department from another healthcare centre as no pulse could be obtained after the application of venous catheters to both arms (Figure 1-3). In the neonatal unit, it had been attempted for monitoring purposes to open a vascular route to the antecubital fossa in the right arm and when this was not successful, the same procedure had been applied to the left arm. After opening the vascular route, the pulse of the patient first became superficial and then could not be detected, so the patient was transferred to our Emergency Department. On admission, the hands of the patient were warm and pink but no pulse could be obtained in either arm at the wrist level although circulation was determined on color doppler ultrasonography. The time from onset of the event to reaching our clinic was approximately 3 hours. First an umbilical central venous catheter was applied to the patient under Emergency Department conditions, then heat, elevation, PaO₂ monitoring and

close monitoring were applied. The circulation of the patient was checked hourly with color doppler ultrasonography. After approximately 6 hours, the pulse returned to both arms and following a further period of treatment and monitoring, the patient was transferred to the Neonatal Clinic.

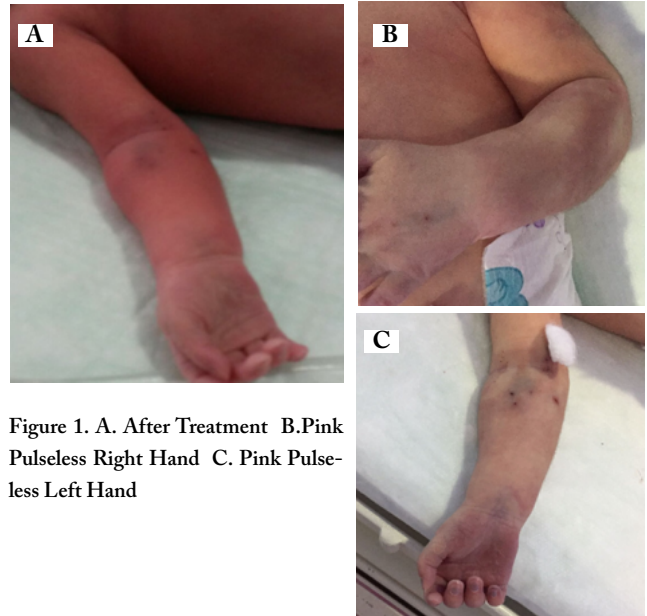


Figure 1. A. After Treatment B. Pink Pulseless Right Hand C. Pink Pulseless Left Hand

DISCUSSION

In patients presenting at the Emergency Department, venous catheters are frequently applied to provide rapid medication and hydration without causing repeated pain to the patient. Although ischaemia in the hand is generally associated with spasm occurring as a result of trauma, it may also occasionally be the result of incorrect catheterisation of the arterial system instead of the venous system or the administration of inappropriate drugs via the catheter. Arquilla et al reported the case of a 20-year old male patient with accidental catheterisation of the brachial artery and administered with chlordiazepoxide in the Emergency Department, which resulted in upper extremity spasm and ischaemia [10]. That study focused on the arterial vasoconstrictive effect of benzodiazepines in particular, in addition to the vascular damage.

In cases where arterial vascular injury occurs while attempting to apply the venous catheter regardless of the drugs, as in the current case, the circulation of the extremity as a result of the vasospasm, although rare, may become dangerous. This must be kept in mind to be able to avoid catastrophic complications such as the loss of the limb.

Although a pulseless, cold and white hand is an indi-

cation for brachial artery exploration, the treatment of pink, pulseless hand is still a matter of debate. While some writers advocate routine surgical exploration [4], others have stated that if circulation can be detected in the wrist on Doppler USG, children can be safely monitored conservatively [5]. In cases where close monitoring is to be applied, as in the current case of pink pulseless hand which occurred as a result of vasospasm developing related to vascular injury, good results can be obtained without surgical exploration.

Pink pulseless hand, the treatment of which remains a subject of debate, generally occurs following trauma to the elbow. In Emergency Departments, thousands of applications of venous catheters are made every day to patients for various indications, and although extremely rare, it must not be forgotten that even from a frequently applied procedure such as in this case, there could be severe complications such as not obtaining a pulse in both arms. Nevertheless, there should be an awareness that when early diagnosis is made in these patients, good results can be obtained without surgical exploration.

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REFERENCES

1. Kuttner H, Baruch M. Der traumatische segmentare Gefasskrampf. Bruns Beitr. z. Klin Chir. 1920;120:1.
2. Montgomery AH, Ireland J. Traumatic segmentary arterial spasm. Journal of the American Medical Association. 1935;105(22):1741-6.
3. Mustard W, Simmons E. Experimental arterial spasm in the lower extremities produced by traction. Bone & Joint Journal. 1953;35(3):437-41.
4. Blakey C, Biant L, Birch R. Ischaemia and the pink, pulseless hand complicating supracondylar fractures of the humerus in childhood. Bone & Joint Journal. 2009;91(11):1487-92.
5. Malviya A, Simmons D, Vallamshetla R, Bache CE. Pink pulseless hand following supracondylar fractures: an audit of British practice. Journal of Pediatric Orthopaedics B. 2006;15(1):62-4.
6. Mangat K, Martin A, Bache C. The 'pulseless pink' hand after supracondylar fracture of the humerus in children. Bone & Joint Journal. 2009;91(11):1521-5.
7. Griffin K, Walsh S, Markar S, Tang T, Boyle J, Hayes P. The pink pulseless hand: a review of the literature regarding management of vascular complications of supracondylar humeral fractures in children. European Journal of Vascular and Endovascular Surgery. 2008;36(6):697-702.
8. Louahem D, Cottalorda J. Acute ischemia and pink pulseless hand in 68 of 404 Gartland type III supracondylar humeral fractures in children: Urgent management and therapeutic consensus. Injury. 2016;47(4):848-52.
9. Özkul E, Gem M, Alemdar C. et al. Vascular Injury Following Supracondylar Humerus Fractures in Children. Ulus Travma Acil Cerrahi Derg. 2016;22(1):84-9.
10. Arquilla B, Gupta R, Gernsheimer J, Fischer M. Acute arterial spasm in an extremity caused by inadvertent intra-arterial injection successfully treated in the emergency department. The Journal of emergency medicine. 2000;19(2):139-43.

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