

Case Report

Distal Radius Fracture and Cellulitis After Radial Artery Hemostasis on an Elderly Patient

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ABSTRACT

Wound infection after cardiac catheterization is uncommon.¹ Fracture does not seem to have been reported in association with a mechanical compression device. In this case, an elderly woman experienced 2 complications after angiography: cellulitis and fracture. The patient was referred to a dermatologist and orthopedic surgeon for definitive treatment. Advanced age, hospitalization, poor hand hygiene management, and hemostasis device mechanisms could be highlighted as risk factors for the complications. This case report provides learning points for cardiologists to access the radial artery and shows that early recognition of risk factors is fundamental to preventing and managing these complications. (*Iranian Heart Journal 2023; 24(3): 89-93*)

KEYWORDS: Infection, Complication, Angiography

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Wound infections, such as cellulitis, after transradial access are uncommon. A study reported a case of infected cellulitis-associated coronary angiography.¹ Fracture does not seem to have been recorded previously in association with an installation mechanical compression device. Therefore, patient risk assessment is necessary to prevent these complications after the transradial access procedure. Hence, this case discusses an incomplete distal radius fracture and wrist cellulitis after transradial hemostasis in an elderly woman.

Case Report

A 73-year-old woman presented to the emergency department with sudden and persistent nausea for a week without

abdominal pain, chest pain, breathlessness, palpitation, dyspnea on exertion, headache, and dizziness. The patient's past medical history was coronary artery disease and vertigo, and she had been hospitalized in the intensive care unit in the last 6 months due to an acute coronary syndrome. She underwent electrocardiography (fig 1), troponin-I (Table 1), and chest X-ray and was diagnosed with moderate-risk unstable angina. The patient was initially treated and referred to a cardiovascular center for coronary angiography.

Vascular access was performed via the right radial artery with a 6-Fr introducer sheath. A 5-Fr TIG diagnostic catheter was selected for the procedure. Coronary angiography was performed without difficult access in 34 minutes, and the result was 30% mid-left

anterior descending artery stenosis. The procedure was carried out using a TR band (screw press) on the right radial artery. The patient felt pain in her right wrist during the installation of the TR band, which aggravated with movement. The TR band remained in place for 12 hours. After the removal of the TR band, a closure dressing with a water-resistant adhesive bandage was applied. After 9 days of hospitalization, the patient was discharged with slight pain at the puncture site.

Seven days following the angiography, the patient presented to the cardiovascular clinic with cellulitis over the radial puncture site and was referred to the dermatology department for the definitive management of

her infection. A physical examination revealed an erythematous macule over the painful area measuring approximately 5×6 cm, with unclear border and scales and associated cellulitis (fig 2A).

A month following the angiography, the patient still felt pain in her right wrist. There was no history of falls or traumatic events pre-angiography or post-angiography in her wrist. The localist status of the right forearm revealed tenderness of the right distal radial bone, and the passive and active ranges of motion were limited. A wrist X-ray showed an incomplete distal radial fracture (fig 3A). She was referred to an orthopedic surgeon for fracture management.

Table 1: Normal results of the patient's complete blood, kidney function, cholesterol, cardiac marker, and electrolyte tests

Blood Tests	Result	Normal Value
Hemoglobin	14	13-16 g/dL
Hematocrit	43	40-50 %
Leukocyte	8000	4.000 – 10.000 /mm ³
Thrombocyte	270.000	150.000 – 440.000 / mm ³
Urea	29.8	15-50 mg/dL
Creatinine	0.76	0.7-1.2 mg/dL
Estimated glomerular filtration rate	79.5	51 -77 mL/ min/ 1.73
Total cholesterol	163	<200 mg/dL
Triglyceride	127	<150 mg/dL
High-density lipoprotein	51	40-60 mg/dL
Low-density lipoprotein	87	<100 mg/dL
Troponin-I	<2	<2 ng/dL
Sodium	138	135-145 mmol/L
Potassium	3.6	3.5-5.5 mmol/L

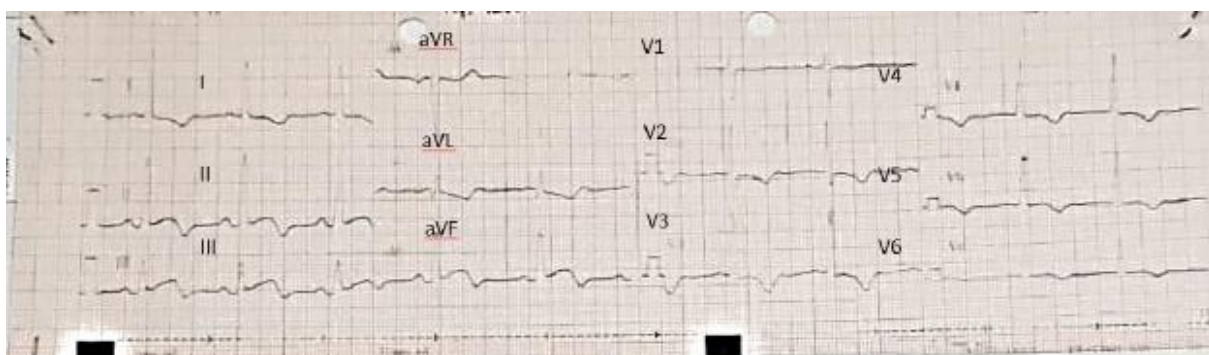


Figure 1: The patient's electrocardiogram indicates sinus rhythm, extensive anterior ischemia, and left ventricular hypertrophy.



Figure 2: Right Wrist A: The patient was reviewed at the clinic 7 days after angiography. The examination showed an erythematous macule over the painful area measuring approximately 5 x 6 cm, with unclear borders, scales, and associated cellulitis. **B:** The patient was reviewed at the clinic 2 weeks after treatment, and the cellulitis was clinically improved.



Figure 3: The patient's right-hand wrist X-ray shows A) an incomplete right distal radius fracture (the red arrow) and B) a review of the patient 2 years following the angiography, showing no signs of fracture.

The differential diagnoses for this case included infected hematomas, skin abscesses, and soft tissue injuries. Nonetheless, we excluded the above diagnoses following further physical

examinations and investigations. Right wrist cellulitis and an incomplete distal radius fracture were the working diagnoses.

A lateral right-hand wrist X-ray showed an incomplete distal radial fracture (fig 3A). Further laboratory examinations for cellulitis were not needed.

The initial treatment for unstable angina consists of the loading and maintenance doses of dual-antiplatelet therapy, low-molecular-weight heparin, β -blockers, Angiotensin-converting enzyme inhibitors, and statins. The patient was referred to the dermatology and orthopedic departments for cellulitis and fracture management due to persistent pain in her wrist. Additionally, she received antibiotics and antihistamines for 7 days and had her right wrist cast.

The patient was reviewed at the clinic 2 weeks after treatment, and the cellulitis was clinically improved (fig 2B). Two years following angiography, a wrist X-ray showed no signs of fracture (fig 3B).

DISCUSSION

The case presented here demonstrates a rare complication of the transradial access of coronary angiography, causing wrist cellulitis. Wound infections, such as cellulitis, after cardiac catheterization are uncommon. There has been a report of infected cellulitis associated with coronary angiography, revealing that 1 of 39 complications was cellulitis.¹ Rathore et al² also reported a significantly higher incidence of late local infection (occurring at 2-4 wk) and abscess formation at the puncture site.

To our knowledge, the risk of wound infection is influenced by the characteristics of the individual, their wound, and the environment.³ A study reported that the elderly were predisposed to invasive skin and soft tissue infection.⁴ Puncture wounds might cause *Pseudomonas* osteomyelitis and cellulitis.⁵ Other risk factors reported for this complication include the presence of heart failure and procedure-related factors (eg, difficult access, repeated punctures, and

prolonged catheter insertions), although this point is controversial. Environmental risk factors include hospitalization, inadequate hand hygiene, and unhygienic environments.^{2,6} Our patient was hospitalized for 9 days, increasing the risk of exposure to antibiotic-resistant microorganisms. The patient also did not remove the wound dressing for a week after discharge. Consequently, in this case, advanced age, hospitalization, and poor hand hygiene management could be highlighted as the risk factors for wrist cellulitis.

Fracture does not seem to have been recorded previously in association with the installation mechanical compression device. The potential of the mechanical compression device causing fracture is also multifactorial. Previous studies have found that distal radial fracture occurs in older patients. The fracture risk increases with age, even if bone mass density remains stable. In women, a clear change in skeletal status occurs at menopause.⁷ We utilized a TR band screw press for radial hemostasis in this case. The hemostasis mechanism of this device was tourniquet, screw-based compression of a hard surface toward the radial artery.⁸ Fracture could occur if the bone imparts more load than the bone could sustain.⁹ When the device directly exerts excessive pressure on the puncture site, a fracture could occur. As another option for hemostasis, an active closure device could be considered.¹⁰

CONCLUSIONS

Our case provides significant learning points for cardiologists accessing the radial artery, highlighting the notion that elderly patients undergoing coronary angiography are prone to wound infection. Early recognition, addressing factors contributing to wound infection, and implementing a wound care plan are fundamental to wound infection prevention and management.²

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Conflict of Interest: None

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