

# Accordion Phenomenon in the Radial Artery Should we treat the radial as a coronary artery?

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## ظاهرة الأكورديون في الشريان الكعبري هل ينبغي لنا معالجة الشريان الكعبري بمثابة الشريان التاجي؟

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**الملخص:** تعد ظاهرة الأكورديون حالة معروفة في مجال طب القلب التداخلي. وهي حالة حميدة تم وصفها بصورة رئيسية في الشرايين التاجية المتعرجة أثناء التدخلات التاجية عن طريق الجلد. ويعتقد أن سببها سلك التوجيه. لم تلاحظ هذه الظاهرة سابقا في الشريان الكعبري. في هذه الدراسة نقدم حالة لظاهرة الأكورديون في الشريان الكعبري، التي اختفت بعد أن تم استرجاع القسطرة والسلك. وقد اختفت التضيقات الزائفة تماما في الصور اللاحقة  
**مفتاح الكلمات:** الشريان الكعبري؛ التدخل التاجي عن طريق الجلد؛ المضاعفات تقرير حالة؛ فرنسا.

**ABSTRACT:** The accordion phenomenon is a well-known finding mechanism in the field of interventional cardiology. It is a benign condition and has mainly been described in tortuous coronary arteries during percutaneous coronary interventions. It is believed to be induced by a stiff guidewire. However, this phenomenon has not been observed previously in the radial artery. We present a case of accordion phenomenon in the radial artery, which was successfully resolved after the catheters and the wire were retrieved, with the pseudolesions found to have completely disappeared in subsequent image findings.

**Keywords:** Radial Artery; Percutaneous Coronary Intervention; Complications; Case Report; France.

**T**HE TRANSRADIAL APPROACH HAS BEEN growing steadily and has become an elegant and popular technique for coronary angiography and intervention because it has been associated with a reduced incidence of vascular access complications.<sup>1</sup> Moreover, it offers early ambulation and less discomfort thus significantly improving the patient's quality of life as compared to the femoral approach.<sup>2</sup> We present a case of accordion phenomenon during transradial percutaneous coronary intervention.

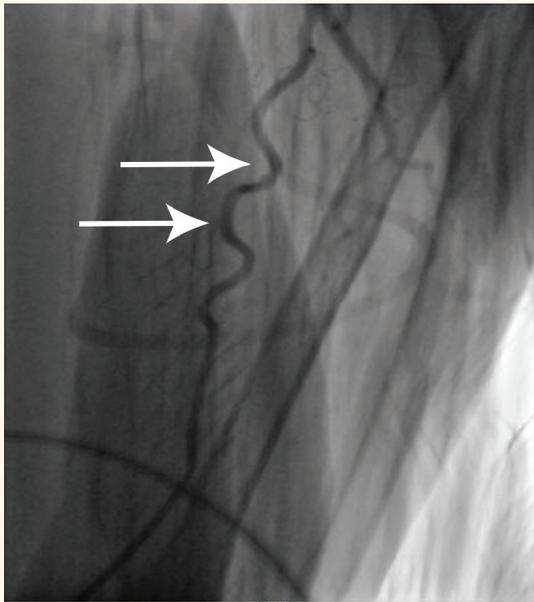
## Case Report

An 84-year-old female presented with symptoms of heart failure. A coronary catheterisation took place via the left radial access since the right radial pulse was not perceived. The operator encountered resistance while advancing the 0.35-inch wire. The forearm angiogram showed adequate calibre but a tortuous radial artery [Figure 1]. Under fluoroscopy guiding, a 0.014-inch soft guidewire (ChoiCE<sup>®</sup>, Floppy LS, Boston Scientific, Natick,

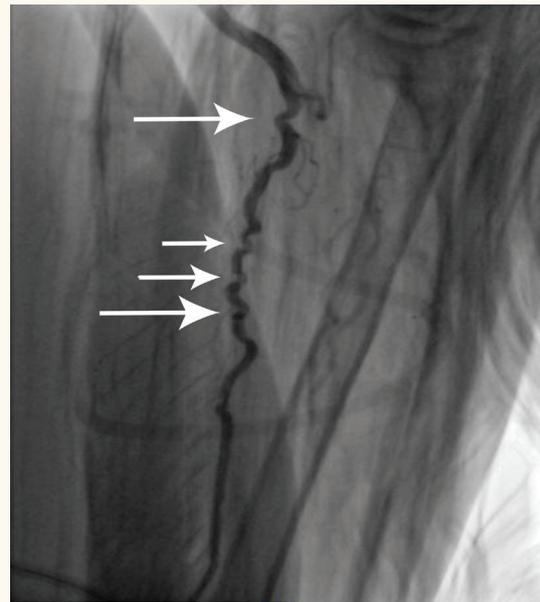
Massachusetts, USA) was successfully advanced as far as the brachial artery thus straightening the radial tortuosities [Figure 2]. The second radial angiography showed a complex stenosis along the radial artery resistant to the administration of intra-arterial nitrate [Figure 3]. The patient did not note any pain or discomfort at the level of the forearm. Then, a diagnostic Judkins right coronary catheter (JR4 5 Fr) was easily advanced [Figure 4] and the coronary angiogram was successfully performed, showing normal coronary arteries. After the catheters and the wire were retrieved, the prior image findings of the pseudolesions were found to have completely disappeared.

## Discussion

In many interventional centres, radial access has emerged as the default strategy for both diagnostic and interventional procedures. However, anatomic variations at the level of the radial artery such as high radial artery bifurcation, loops and tortuosities,



**Figure 1:** Arterial angiogram showing the left radial tortuosities (white arrows).



**Figure 3:** Arterial angiogram showing the accordion phenomenon (white arrows) of the left radial artery.

are not uncommon and can be associated with prolonged procedural duration and radiation exposure, or even can generate more procedural failures.<sup>3</sup> For these reasons, some authors have suggested a preliminary angiogram of the arteries of the forearm through the introducer inserted into the radial artery.<sup>4</sup> Our strategy consisted of performing a radial artery puncture, inserting the sheath, injecting *in situ* vasodilators (verapamil), and then advancing the 0.35-inch J-wire through

the radial sheath with the support of the catheter with no primary forearm angiogram.

If any resistance is encountered during the advancement of the wire, the operator should perform an angiogram to verify the underlying anatomy of the forearm arteries. This would enable the operator to negotiate the anatomic variations under fluoroscopy by using hydrophilic wire (Terumo, Tokyo, Japan) or even a 0.014-inch



**Figure 2:** Fluoroscopy showing the straightening of the tortuosities of the left radial artery with the 0.014-inch guidewire.



**Figure 4:** Advancement of the Judkins right catheter (JR4 5 Fr) through the left radial artery over the 0.014-inch guidewire.

guidewire.

The accordion, or concertina, phenomenon is a reversible vessel wall shortening and a deformity believed to be due to arterial telescoping. It is produced by the mechanical adaptation of the geometry and curvature of the vessel. The straightening effect, shortening of the artery at one level, lengthening at another, and the vasoconstrictive effects due to guidewire or catheter balloon manipulation lead to angiographic slit-like multiple filling defects along the longitudinal axis of the involved vessel. This pseudo-narrowing, or pseudostenosis, has been described mostly during percutaneous coronary interventions, and mainly in tortuous vessels.<sup>5</sup>

The differential diagnosis for this benign condition includes more serious conditions like dissection, spasm and thrombosis.<sup>6</sup> Three major factors contributed to this phenomenon: tortuosity of the artery, the use of a stiff guidewire, and long stenting.<sup>7</sup> It has been also described with a soft guidewire.<sup>8</sup> Vasodilators are frequently ineffective and the suggested therapeutic management is to remove everything from the vessel, resulting in the reformation of the vessel and the re-establishment of the coronary geometry.

This coronary phenomenon has also been described in the internal mammary,<sup>9</sup> carotid<sup>10</sup> and external iliac arteries.<sup>11,12</sup> However, it has never been reported in the radial artery.

## Conclusion

To the best of our knowledge, this is the first reported case of the accordion phenomenon induced by a soft guidewire in the radial artery during percutaneous coronary intervention. Thus, the 'radialists' should be aware of the possibility of intussusceptions and the twisting of the radial artery and should avoid conflicting diagnoses which may lead to unnecessary complex interventions, converting a totally reversible event into an iatrogenic complication.

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