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Case Report

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An uncommon collateral pathway in a renal artery occlusion due to takayasu's arteritis

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ABSTRACT

Takayasu's Arteritis is a rare vasculitis that affects large vessels. We experienced a case of renal artery occlusion in a 27-year-old woman suffering from Takayasu's Arteritis. On Computed Tomography Angiography, a millimetric outpouching simulating a stub was detected at the level of right renal artery orifice. Feasibility of endovascular intervention was evaluated with Digital Subtraction Angiography. However, no luminal filling could be demonstrated beyond the outpouching. While seeking the collateral circulation, the subphrenic artery trunk was shown to be the source. The subphrenic artery should be kept in mind in case the source of collateral filling could not be detected in a renal artery occlusion.

1.Introduction

Takayasu's Arteritis (TA) is a granulomatous systemic vasculitis causing arterial stenosis, thrombosis, and aneurysms. Although TA principally affects the aorta and its main branches, the renal arteries may also be involved. It may result in renal artery occlusion (Gotway et al.,2005; Chaudhry and Latif, 2013).

Renal artery occlusion does not always result in kidney injury. Collateral circulation frequently reconstructs the occluded artery (Bergqvist et al., 2001). Existance of collaterals indicates a haemodynamic significant stenosis, yet they are not always identified (Henney et al., 1982; Bergqvist et al., 2001). They can be used as an outflow for endovascular interventions (Bergqvist et al., 2001). Hence, determination of the collaterals is favourable for the procedures.

In this study, we aimed to emphasize the efficiency of Digital Subtraction Angiography (DSA) in order to demonstrate collaterals, and to present an uncommon collateral pathway in renal artery occlusion.

2. Case Report

A 27-year-old woman followed-up with the diagnosis of TA had a progressive increase in the serum creatinine levels. Her right kidney was diminished in size, and her left kidney was atrophic on Ultrasound examination. Computed Tomography Angiography (CTA) showed that branches of the aortic arch and abdominal aorta were involved by the disease. The abdominal aorta was narrowed with irregular borders due to calcified plaques. The right renal artery was not visualised entirely. At the level of the orifice, a milimetric outpouching simulating a stub of nearly occluded renal artery was detected. However, the distal part of the artery was normal. . The left renal artery could not be visualised (Figure 1). The patient was consulted by interventional radiology department in order to evaluate the feasibility of endovascular intervention for the right renal artery with this background. The angiographic procedure was performed with a monoplane DSA unit (Artis Zee, Siemens, Munich, Germany). Nonselective angiograms were obtained by using a 5-French (F) diagnostic pigtail catheter (Imager II, Boston Scientific, Marlborough, Massachusetts, USA) located at the 12th thoracic vertebral body level. The angiograms revealed that the abdominal aorta was narrowed with irregular borders. A millimetric out

pouching was detected at the level of the right renal artery orifice (Figure 2). This outpouching was tried to be catheterized gently by a 5FPP Simmons 1 catheter (Tempo Aqua, Cordis, Miami Lakes, Florida, USA) in order to recanalize. However, no luminal filling could be demonstrated beyond it. To identify the feeder of the right kidney, the superior mesenteric artery and the celiac trunk were catheterized. Nevertheless, no collateral circulation was demonstrated. While seeking the other probable pathways, the subphrenic artery trunk was catheterized incidentally. The subphrenic artery angiograms revealed that there were several collaterals reconstructing the renal artery just before the renal hilum. These were associated with the suprarenal artery and the capsular artery of the kidney (Figure 3). Having seen that both of the renal arteries were occluded, and blood flow of the right kidney was provided by collaterals, endovascular intervention was abandoned.

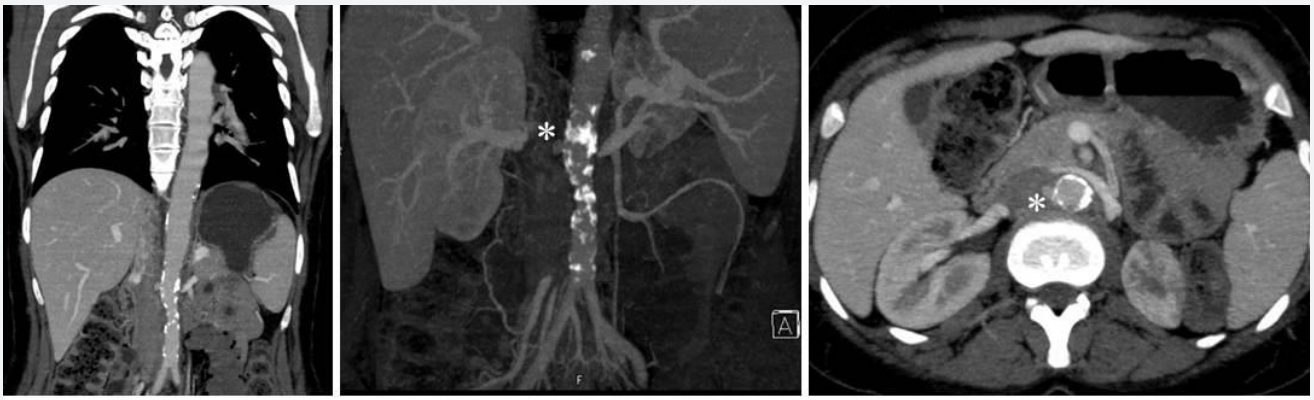

Fig. 1.

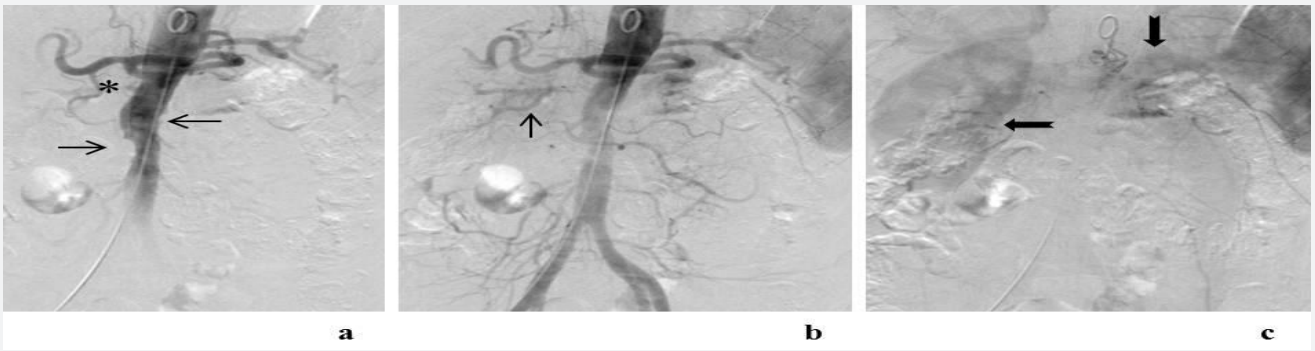

Fig. 2.

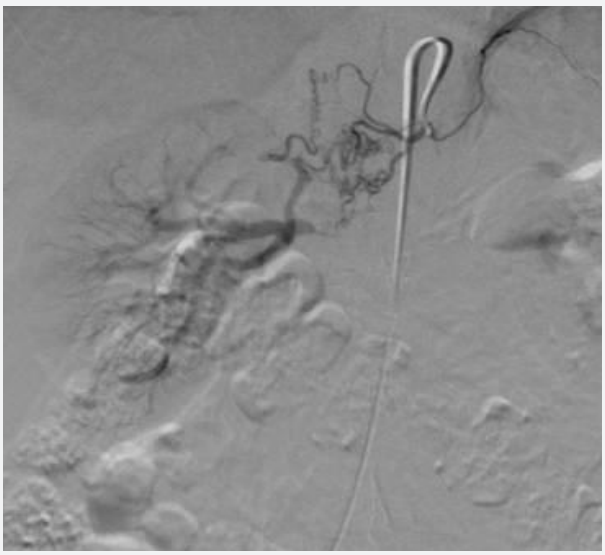

Fig. 3.

3. Discussion

Early and late-phase of TA represent different pathologic features. In the early-phase, great vessel wall thickening is the primary feature. Hence, CTA is helpful for the early diagnosis since it is able to depict wall thickening, as well as luminal narrowing (Park et., 1997). Diagnostic evaluation of TA has been carried out with the assistance of DSA, traditionally (Park et., 1997; Gotway et al.,2005). Long, smooth, tapered stenoses or frank occlusions are well shown on DSA (Park et al., 1989; Gotway et al.,2005). However, DSA is not convenient to distinguish luminal narrowing due to acute mural inflammation from stenosis due to chronic transmural fibrosis since it cannot demonstrate changes in the wall architecture as obviously as CTA (Yamada et al., 1993; Gotway et al.,2005). On the other hand, collateral vessels are well shown because DSA is actually a luminography. The imaging findings of the patient confirmed that knowledge. Collateral pathways secondary to renal artery occlusion were listed by Bergqvist et al. as follows: along the ureter, by the

suprarenal arteries, from the capsular arteries, from the lumbar arteries and rarely by the mesenteric vessels (Bergqvist et al., 2001).

The collateral circulation involving the lumbar arteries was reported to be the most common (Hietala and Kunz, 1979). Duan et al. (Lian et al., 2014) reported a case with collateral circulation originating from the subphrenic artery. To the best of our knowledge, it is the unique report mentioning the pathway. One should look for the subphrenic artery as a source of collateral filling in case routine angiographic examinations fail to show the origin.

Radiological findings suggesting renal artery occlusion does not always mean the kidney will be lost, since collaterals frequently reconsruct the occluded artery. Physicians who are not familiar to this knowledge may worry about the affected kidney. With therefore, they consider that an immediate intervention is compulsory. They should be warned with respect to this fact, and redundant interventional requests should be precluded.

Although predominant findings of TA are stenotic or occlusive changes, fusiform or saccular aneurysms may also be found (Matsumura et al., 1991). Hence, any outpouching could represent a saccular aneurysm. Because of the weakened structure of aneurysm wall, its catheterization requires attention against the risk of rupture.

4. Conclusion

To detect collaterals, DSA is an excellent diagnostic tool of choice. The subphrenic artery should be kept in mind in case the source of collateral filling could not be detected in renal artery occlusion. Findings suggesting renal artery occlusion do not always mean the kidney will be lost. Finally, any outpouching encountered during angiograhic procedure in a patient with TA requires attentive catheterization against the risk of rupture.

The Authors declare that there is no conflict of interest. Informed written consent for patient information and images to be published was provided by the patient.

REFERENCES

Bergqvist D., Bostro¨ m A., Karacagil S., et al., 2001. A New Collateral Pathway in a Patient With Renal Artery Occlusion. Eur J Vasc Endovasc Surg. 21, 187−188. Chaudhry M.A., Latif F., 2013. Takayasu's arteritis and its role in causing renal artery stenosis. Am JMed Sci. 346, 314−318.

Duan L, Feng K, Tong A., et al., 2014. Renal artery stenosis due to neurofibromatosis type 1: case report and literature review. Eur J Med Res. 19, 17.

Gotway M.B., Araoz P.A., Macedo T.A., et-al., 2005. Imaging findings in Takayasu's arteritis. AJR Am J Roentgenol. 184, 1945−1950.

Henney D.J., Bookstein J.J., Carey P.H., et al., 1982. The role of pararenal collaterals in assessing renal artery stenosis before and after percu taneous transluminal angioplasty. Cardiovasc Intervent Radiol. 5, 71−78.

Hietala S.O., Kunz R., 1979. Collateral circulation in stenosis or occlusion of the renal artery. Cardiovasc Radiol. 2, 249−255.

Matsumura K, Hirano T, Takeda K, et al., 1991. Incidence of aneurysms in Takayasu's arteritis. Angiology. 42, 308−315.

Park J.H., Chung J.W., Lee K.W., et al., 1997. CT angiography of Takayasu arteritis: comparison with conventional angiography. J Vasc Interv Radiol. 8, 393−400.

Park J.H., Han M.C., Kim S.H., et al., 1989. Takayasu arteritis: angiographic findings and results of angioplasty. AJR. 153, 1069−1074.

Yamada I, Numano F, Suzuki S., 1993. Takayasu arteritis: evaluation with MR imaging Radiology. 188, 89−94.