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Case Report

Radiation induced vasculitis of iliac veins: presentation of a case and therapeutic dilemmas

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ABSTRACT

A case of radiation-induced venous stenosis (phlebitis) after pelvic irradiation in a patient with prostate cancer is reported. Progressive swelling of both lower limbs developed due to bilateral external iliac vein stenosis. Conservative treatment with new oral anticoagulants and elastic stockings was conducted with clinical improvement of symptoms. Serial duplex scanning with trimestral frequency reveals no other progression of stenosis and the patient is well 2 years after diagnosis. Lack of data in the current literature makes management of this disease problematic.

Keywords: Radiation, Vasculitis, Iliac veins, Phlebitis

INTRODUCTION

Radiation vasculitis is a rare clinical and nosological entity. Although rare, radiation-induced arteritis has been well described.[1] This is not valid for the irradiated veins, the treatment of which is obscured and mainly empirical. A case of bilateral external iliac vein (EIV) stenosis after radiation therapy for prostate cancer that was treated conservatively is reported.

CASE REPORT

A 68 years old male with poorly differentiated (Gleason score 9) adenocarcinoma of the prostate gland was diagnosed 7 years ago. The tumor invaded adjacent structures other than the seminal vesicles and also regional lymph nodes were invaded. The patient underwent radical prostatectomy with concomitant lymphadenectomy and the disease was classified in accordance with the TNM classification as pT4N1, R1 (positive surgical margin). Subsequently the patient received hormonal therapy and a cumulative dose of 70 Gy of radiotherapy to the whole pelvis. Periodic computed tomography scans did not reveal any recurrence of the disease.

The patient noticed progressive swelling of his lower limbs, predominantly on the left, during the last two months. Additionally, he complained of aching and heaviness sensation on both limbs. Duplex ultrasound scan (DUS) showed a severe stenosis on the left EIV and a less severe stenosis on the right EIV. Because of significant obesity of the patient, visualization of inferior vena cava was not feasible, so a magnetic resonance venography (MRV) was ordered. The MRV confirmed the results of the DUS (Figure 1). There was no evidence of stenosis or thrombosis elsewhere in the pelvis or abdomen. It was decided to start anticoagulation treatment with new oral anticoagulants (NOACs) and compression therapy with elastic stockings Class II (23-32 mmHg). Clinical improvement of symptoms was almost immediate. Serial DUS were suggested with a 3 months frequency. At the 2 years follow up the patient was doing well clinically with significant improvement of swelling and DUS showing no progression of stenotic lesions.

Figure 1: Magnetic resonance venography showing severe stenostic lesions on the external iliac veins, especially on the left, following radiotherapy for prostate cancer.

DISCUSSION

Radiation-induced vasculitis is a rare vascular disease. It has been estimated that vascular damage takes several years and sometimes decades to develop. The true incidence of the disease is hard to estimate primarily because of the poor prognosis that many cancer patients have. Consequently, many cancer patients die before radiation-induced vasculitis may be manifested. It has been estimated that a radiation dose of 39, 5 to 80 Gy can induce severe arterial damage.[1] At this point it is mandatory to refer some paradoxical elements comparing radiation induced arteritis and phlebitis.

Although the arterial wall is thicker than the venous one, it can be expected that radiation induced phlebitis could be more common than arteritis. In a literature review this hypothesis is not confirmed, because there are only a few cases of radiation induced arteritis and even less cases of radiation induced phlebitis. It is supposed that in vivo the basal membrane of the arterial wall could have a protective effect against radiation. This could render veins more susceptible in the deleterious effects of radiation, due to their anatomic characteristics, but again this is not confirmed in the current literature. We have learned from radiation arteritis, from a histopathological point of view, that injury to the vasa vasorum with ischemic necrosis of the vessel wall (hypoxia of the wall) and thickening of the latter due to fibrin deposition could lead to stenotic or even occlusive lesions. Strangely enough, there is a lack of vasa vasorum in the venous wall.[2] This makes veins more resistant to ischemic lesions caused by radiation and maybe this is the reason why veins are less affected than the arteries. Additionally, in the arteries smooth muscle cell proliferation may be a cause of stenosis or occlusion after radiotherapy.[3] This cannot be true in the vein wall where smooth muscle cells are scarse. On the contrary, there might be a correlation between arterial and venous damage regarding endothelium. This layer is considered to be very radiosensitive. Therefore, endothelial proliferation could lead to arterial and venous stenosis. From the aforementioned pathogenetic elements, it does not become clear which is the true mechanism of vein wall damage caused by radiation. It is important to underline the individual susceptibility to the effects of radiation.[4] Another interesting point is that the time space between radiotherapy and clinical expression of the phlebitis is extremely variable in the few cases reported. This time space varies between a few months and ten years. In the case reported herein it took 7 years until the disease became clinically manifest.

Regarding treatment modalities of stenotic or occlusive lesions in the veins there are no data due to the paucity of cases in the literature. There are two main therapeutic axes: conservative and surgical. Conservative treatment is mainly symptomatic consisting of elastic stockings and maybe anticoagulants, while surgical treatment consists of angioplasty and stenting of the stenotic lesion, usually with self-expandable metal stents followed by balloon angioplasty. There is a concern about resistance of the lesions during dilatation, residual stenosis after stent expansion and of course about long-term patency of the stents. In the few cases treated by endovascular means reported the follow up is extremely short.

So, behavior of the stents in treating such lesions, where thickening of the venous wall with fibrin deposition is prominent, is largely unknown and inconclusive. In the aforementioned case such reflections arose, making the choice of the therapeutic pathway difficult. Elastic stockings class II, in association with therapeutic dose of rivaroxaban and strict follow up with serial duplex scanning every 3 months was chosen as a first approach. Duplex ultrasound exam is a useful tool to recognize as soon as possible further restriction of the venous lumen in order to intervene promptly surgically, avoiding deep vein thrombosis. Clinical improvement of swelling and lack of stenosis progression 24 months after diagnosis eventually has justified this decision.

CONCLUSION

In conclusion the effect of adjuvant radiotherapy for malignancies on the vein wall and the histopathological changes are mostly unknown. Changes on the arterial wall have been studied and consequently we can extrapolate information regarding the vein wall, although there are substantial structural differences. Literature regarding treatment of such lesions is sparse, giving space to improvisation. In this case, conservative treatment seems to be a valid alternative given that the patient has not developed further stenosis or deep vein thrombosis during the 2 years follow up.

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