

Correlation Doppler ultrasound index vascular on kidneys, penis, and digital arteries in patient with systemic sclerosis: what obstacles?

D. Messineo

Department of Radiological Sciences, Oncology and Anatomic-Pathological Science, Roma, Italy

Abstract

It has been known since 1990 and specifically for Systemic Sclerosis in renal involvement since 1995 the possibility of identifying a variation of the resistivity index during illness.

The study on which we want to pay attention shows an innovative and interesting correlation in the possible erectile dysfunction of the penis (ED) in patients with systemic sclerosis (SSc) about Doppler ultrasound indices of penis and kidneys and digital arteries in male with systemic sclerosis (11).

Already the authors have reported a limit and an opening to a possible deepening for a study with more extensive case studies and the deepening with the pharmacological stimulation to evaluate veno-occlusive function. We would like to introduce a reflection on these investigations in addition to the problems of concurrent erectile dysfunctions because all the diseases that see an implication of the male genital sphere in primis are generally difficult to investigate for intercurrent psychosociological problems (15). Well-explored and well defined is the damage that involves the vascular trophism of the hand and fingers.

The article is about five years ago but the argument for the delicacy and complexity of collecting and correlating the laboratory, imaging data and the evolution of the disease at the level of life in the private sphere has a character of current interest. While we congratulate the courage, we think it is important to increase these studies, especially because the SSc is still highly disabling and ED related are poorly understood. *Clin Ter 2018; 169(6):e272-273. doi: 10.7417/CT.2018.2091*

Key words: Contrast-enhanced ultrasound, systemic sclerosis, penis disease, kidney ultrasonographic index, social interaction

Sir,

almost all the articles on systemic sclerosis just because we know little about this pathology begins by recalling its base, quite to remember the identifying coordinates of the pathology. Systemic sclerosis (SSc) is an autoimmune disease characterized by collagen deposition and fibrosis of skin and internal organs (4,16). The hallmarks of SSc are related to endothelial damage, production of autoantibodies

and fibroblast dysfunction (7). Systemic sclerosis is an autoimmune disease characterized by damage to the small vessels and fibrosis mainly supported by the progressive accumulation of collagen fibers in the tissues of the skin, particularly the hand, (13) and a lot of internal organs. Such alterations can also affect the male sexual organ, resulting in erectile dysfunction (9).

Initially renal and penis ultrasound only for morphological study immediately afterwards the advent of the Color Power Doppler metric tests and immediately showed the best tolerated imaging method and therefore since the 90s it has been used for the evaluation of many diseases both regions renal and penis (3). It has been investigated on pathologies especially for the region of the penis on atherosclerotic base but much less for the systemic pathologies and for the SSc (10,14). Most cases of erectile dysfunction of organic causes are related to changes in blood flow in the corpora cavernosa, represented by occlusive artery disease, most often of atherosclerotic origin, or due to failure of the veno-occlusive mechanism (2).

The scleroderma, on the other hand, vasculopathy has mainly two characteristic elements: the obliterative microangiopathy and the proliferative alteration of the small arteries. Really, from the initial stages it is possible to observe a diffused endothelial damage, whose genesis is not well known as of the initial stages it is possible to observe a diffused endothelial damage, whose genesis is not well known. Endothelial damage determines high serum factor VIII factor von Willenbrand antigen and promotes the activation of circulating platelet aggregates and high levels of plasma beta-thromboglobulin with probable release of growth factors (TGF-beta, PDGF).

The originality of this article was to identify a possible correlation with an underlying vascular and connective disease of the three districts. They investigated the erectile function by the international index of erectile function-5 (IIEF-5), peak systolic velocity, end diastolic velocity, resistive index, pulsative index, and systolic/ diastolic ratio were measured on the cavernous arteries at the penoscrotal junction in the flaccid state, the interlobar artery of kidneys and vascular damage of hands digital arteries (12,17).

Correspondence: Daniela Messineo. E-mail: daniela.messineo@uniroma1.it

Color Doppler ultrasound of the penis has extremely high sensitivity, specificity and accuracy for the diagnosis of acute vascular disease. The application of power Doppler improves sensitivity for slow flow even further. Diagnosis and treatment of etiologies for erectile dysfunction relies on spectral Doppler investigation of the cavernosal arteries after a physiological response to a prostaglandin injection (12). Although available in Europe since the early 1990s, ultrasound contrast agents are poorly understood by physicians. There are many potential clinical indications, with the benefits of ultrasound including absence of radiation or nephrotoxicity. Also, the safety profile for microbubble contrast agents greatly exceeds those for iodine or gadolinium-based agents (6).

The authors have reported a limit and an opening to a possible deepening for a study with more extensive case studies and the deepening with the pharmacological stimulation to evaluate veno-occlusive function. Many centers gathering their solicitation in these years have concentrated on the monitoring of drugs in search of being able to identify thanks to the imaging an evolution of the pathology in search of a drug that blocks the SSc disease.

We should like to introduce a reflection on these investigations in addition to the problems of concurrent erectile dysfunctions because all the diseases that see an implication of the male genital sphere *in primis* are generally difficult to investigate for intercurrent psycho-sociological or modesty problems and especially because the SSc is still highly disabling and ED related are poorly understood.

The article is about five years ago but the argument for the delicacy and complexity of collecting and correlating the laboratory imaging data and the evolution of the disease at the level of life in the private sphere has a character of current interest.

Additional assessments would be needed with cross-sectional studies with additional clinical parameters such as answering the questionnaire, the erection hardness grading scale (EHGS), and global self-assessment of potency (GSAP) sometimes the search for simplification of diagnosis with imaging leads to problematic issues related to the global aspects of the individual (1).

The appearance of erectile dysfunction further impacts negatively on the subject's quality of life, with significant repercussions on relationship and couple life. There are many therapeutic options for the study to be evaluated with an expert urologist, the administration of vasodilators belonging to the prostaglandin class through direct injection into the corpora cavernosa or for intraurethral application or the use of penile prosthesis (8).

In relation to the frequency with which erectile disorders appear in the systemic sclerosis and to the nature of the disorder, the use of validated questionnaires to be administered periodically to the patients can make it possible to identify and deal with this delicate problem (14).

The appropriately used ultrasonography can correlate the damage both in the renal, penile and cutaneous district and the benefit derived from the therapies. It remains however

that the systemic sclerosis is a disabling pathology and, in our days, still not completely resolvable and this requires a further effort of the research to face it and we hope in a future not far resolve it.

References

1. Aversa A, Proietti M, Bruzziches R, et al. The penile vasculature in systemic sclerosis: a duplex ultrasound study. *J Sex Med* 2006; 3:554-8
2. Bassiouny HS, Levine LA. Penile duplex sonography in the diagnosis of venogenic impotence. *J Vasc Surg* 1991; 13:75-83
3. Bertolotto M, Pavlica P, Serafini G, et al. Painful penile induration: imaging findings and management. *Radiographics*. 2009; 29:477-93
4. Campbell PM, LeRoy EC. Pathogenesis of systemic sclerosis: a vascular hypothesis. *Semin Arthritis Rheum*. 1975; 4:351-68
5. Cowper S, Robin H, Steinberg S et al. Scleromyx edema like cutaneous diseases in renal-dialysis patients. *Lancet*. 2000; 356: 1000-1
6. David E, Cantisani V, De Vincentiis M, et al. Contrast-enhanced ultrasound in the evaluation of parotid gland lesions: an update of the literature. *Ultrasound*. 2016; 24(2):104-10
7. Dowson C, Simpson N, Duffy L, et al. Innate Immunity in Systemic Sclerosis. *Curr Rheumatol Rep* 2017; 19:2
8. Fiori G, Marzi T, Bartoli F, et al. The challenge of pet therapy in systemic sclerosis: evidence for an impact on pain, anxiety, neuroticism and social interaction. *Clin Exp Rheumatol*. 2018; 36 Suppl 113(4):135-141. Epub 2018 Sep 20
9. Impens AJ, Seibold JR. Vascular alterations and sexual function in systemic sclerosis. *Int J Rheumatol*. 2010; 139020
10. Pi ZB, Lin H, He GD, et al. Randomized and controlled prospective trials of Ultrasound-guided spinal nerve posterior ramus pulsed radiofrequency treatment for lower back post-herpetic neuralgia. *Clin Ter* 2015;166(5):e301-5
11. Rosato E, Barbano B, Gigante A, et al. Doppler ultrasound study of penis in men with systemic sclerosis: a correlation with Doppler indices of renal and digital arteries. *Int J Immunopathol Pharmacol*. 2013; 26(4):1007-11
12. Rosato E, Gigante A, Barbano B, et al. Prognostic Factors of Renal Involvement in Systemic Sclerosis. *Kidney Blood Press Res* 2018; 43:682-9
13. Ruaro B, Sulli A, Smith V, et al. Microvascular damage evaluation in systemic sclerosis: the role of nailfold videocapillaroscopy and laser techniques. *Reumatismo*. 2017 Dec 21;69(4):147-155. doi: 10.4081/reumatismo.2017.959.
14. Schiavone R, Narese D, Ognibene N, et al. Sonographic diagnosis of hepatic erosion caused by umbilical catheterization. *Clin Ter* 2016; 167(3):80-1
15. Spaziani E et al. Bilateral hydrocele. Uncommon clinical presentation of primary testicular lymphoma in the elderly. *Clin Ter* 2017; 168(2):e136-e139. doi: 10.7417/CT.2017.1995
16. Tublin ME, Bude RO, Platt JF. The resistive index in renal Doppler sonography: where do we stand? *AJR Am J Roentgenol*. 2003; 180(4):885-92
17. Walker UA, Tyndall A, Ruszat R. Erectile dysfunction in systemic sclerosis. *Ann Rheum Dis*. 2009; 68:1083-85