Sonographic features of complicationes secondary to orchitis-epididymitis

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Learning objectives

To present the most common complications of orchitis-epididymitis and to describe the sonographic findings in each one of them in order to provide the patient with early and appropriate treatment.
Background

Orchitis-epididymitis is an inflammation of the epididymis and/or testicle and is the most common acute scrotal pathology.

Acute epididymitis is usually the result of a descending infection caused by urinary tract pathogens. In over 35 year olds the most frequent pathogens are Escherichia coli and Proteus mirabilis, and in younger patients they are Chlamydia trachomatis and Neisseria gonorrhoea.

The association between epididymitis and orchitis is due to the direct spread of the infection (bacterial or viral) and it occurs in between 20 and 40 % of cases.

Epididymitis is also a recognised complication of prostatectomy. Both the catheterization of the urinary tract before surgery and infection of the urinary tract after prostatectomy are associated with an increase in epididymitis.

The characteristic clinical symptom is testicular pain (becoming worse when an effort is made to defecate) which can spread to the groin, and can cause fever and disuria.

This pathology does not come without complications which in many cases do not have any specific clinical symptoms. We should suspect this when there is poor patient evolution in spite of correct treatment.

Ultrasound is the imaging technique of choice allowing not only for the diagnosis of orchitis-epididymitis, but also its complications. Therefore we can decide between conservative or surgical treatment in order to prevent a worse prognosis and more serious consequences that could even lead to the loss of the testicle.

The following complications can usually be found and assessed: Testicular ischaemia, pyocele, an abscess, cutaneous scrotal fistula, atrophy and chronic orchitis-epididymitis (more than 3 months).

Sonographically chronic inflammation of the epididymis and/or testis is characterised by an increase in the vasculature, which is usually assessed using a colour Doppler ultrasonography with a sensitivity of 100 %. The presence of a reactive hydrocele is common, which is seen sonographically as an anechoic area surrounding the testis which can lead to septa and becomes more heterogeneous as the disease becomes more chronic. An increase in the thickness of the scrotal wall can also be seen together with an increased echotexture of the epididymis and/or testicle. As a rule, to establish the diagnosis of chronic orchitis-epididymitis one of these features must be present for more than 3 months.

Testicular infarction after epididimitis is probably due to compression of the venous drainage by the oedema, which brings with it the formation of thrombosis. This thrombosis
often develops in the area of the pampiniform plexus (in this area the tissues wrapped around the spermatic chord are relatively rigid).

Segmentary testicular infarction is seen sonographically as a hypoechoic area with well-defined margins, with an apex directed towards the mediastinum testis. It is more common in the upper and medial portion of the testicle. Sometimes it is difficult to distinguish it from a hypovascular intratesticular tumour, so that the patient's background is important.

Venous infarction can become apparent in the pulsed Doppler ultrasound as an inverted diastolic flow.

Pyocele as a complication of orchitis-epididymitis can occur either because of orchitis-epididymitis treatment or because of a rupture in an intratesticular abscess in the area inside the vaginal tunic. The ultrasound image is of a complex hydrocele with loculations and septa.

An epididymal and testicular abscess is the result of the evolution of an acute or chronic orchitis-epididymitis which is not treated or is resistant to treatment.

An intratesticular abscess is sonographically characterised by having irregular walls, containing heterogenic echoes and occasionally peripheral hyperaemia. At the same time a thickened scrotal wall can be seen. An epididymal abscess is a very uncommon complication, producing a thickened and hyperemic epididymis, with reduced or mixed areas of echogenicity. If microabscesses are formed then these can be so small that they cannot be identified sonographically.

Intratesticular abscesses and the epididymis can cause ischaemia or testicular infarction.

Testicular atrophy is more associated with orchitis-epididymitis caused by the parotiditis virus. Sonographically, smaller-sized testicles are observed, sometimes without any other alteration.

Scrotocutaneous fistula is a very uncommon complication.

We will describe the cases found of orchitis-epididymitis complications in the Reina Sofía University General Hospital between 2005 and 2011.

75 cases of orchitis-epididymitis have been registered in this period, of which 15 patients (20 %) had complications. The mean age of our patients was 54 years. Our youngest patient was 15 years and the eldest 84 years. Some of our patients had notable antecedents: previous episodes of orchitis-epididymitis (6 cases) and transurethral prostatectomy (3 cases). The remaining patients did not have any other important antecedents.
The main clinical symptom of our patients was pain in the affected scrotal area and an increase in the size of the testes. Leucocytosis with leftward deviation only occurred in 6 patients (40%). The patients who had chronic orchitis-epididymitis had a normal complete blood count.

We have found the following complications: Chronic orchitis-epididymitis (6 cases) FIG 1 and 2, scrotal abscess (2 cases) FIG 3, intratesticular abscess (2 cases), pyocele (3 cases) FIG 4 and 5, testicular ischemia (1 case) FIG 6, and testicular atrophy in the context of chronic orchitis (1 case) FIG 7.

In the case of chronic orchitis-epididymitis the following sonographic characteristics were found: reactive hydrocele, with multiple septa on the inside and changes in the echostructure of the testicle and/or epididymis for period longer than 3 months. In these cases hydrocelectomy was performed. In one case of chronic epididimitis where the sonographic finding was hyperechogenic micronodular images in the epididymal tail, epididymectomy was carried out, finding chronic epididymitis with several granulomas in the pathological anatomy. In another case of chronic epididymitis the ultrasound showed a thickening of the epididymis with heterogeneous echoes, calcifications and cystic formation on the inside.

The intratesticular abscesses were seen sonographically as collections of thick and irregular walls, with material of mixed echoes on the inside and multiple septa.

It should be mentioned that there were cases of clinically diagnosed testicular abscess, in which an ultrasound was not carried out, proceeding to perform percutaneous drainage of the abscess and culturing of the purulent material.

One case was recorded of a left scrotal abscess, seen sonographically as a loculated hydrocele, with heterogenic internal echoes together with thick, irregular walls together and a thickening of the testicular tunic.

The 3 cases of pyocele in our study were associated with epididymitis. Sonographically, both presented a thickening and heterogenous echotexture of the epididymis and a hydrocele with echogenic material on the inside and several septa of varying thickness.

The case of testicular atrophy, occurred in a patient with chronic right orchitis, which had a hypoechoic focal lesion in the left testicle in the ultrasound images, which was polylobulated, of a cystic appearance, and without Doppler flow on the inside. The clinical diagnosis was chronic orchitis vs. a cold abscess. Orchiectomy was carried out and in the pathological anatomy a chronically inflamed testicle and spermatic chord were found together with peripheral fibrosis, testicular atrophy and an area of bleeding.
Imaging findings OR Procedure details

All images are cases of Reina Sofia Hospital within the period stated in the job.
Fig. 1: CHRONIC EPIDIDYMIS: Thickening of the epididymis´s tail, with heterogeneous echotexture and small calcification inside.

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Fig. 2: CHRONIC EPIDIDYMISIS: Micronodular images hyperechogenic in the epididymis’s tail, corresponds to granulomas. Unaltered testicular parenchyma.

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**Fig. 3:** LEFT SCROTAL ABSCESS: Loculated collection with heterogeneous internal echoes and thickening wall. Thickening of testicular tunica.

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Fig. 4: BILATERAL PYOCELE: Bilateral loculated hydrocele with heterogeneous echoes inside. Both epididymis’s head are thickened and have heterogeneous echotexture. Normal testicular parenchymas.

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Fig. 5: RIGHT PYOCELE: Loculated collection with heterogeneous echoes. Scrotal walls thickening.

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**Fig. 6:** RIGHT ISCHEMIA TESTICULAR: Altered echotexture and hypoechoic areas. Lack of Doppler flow

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Fig. 7: CHRONIC ORCHITIS AND TESTICULAR ATROFY: A hypoechoic focal lesion which was polylobulated, of a cystic appearance, and without Doppler flow on the inside.

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Conclusion

Orchitis-epididymitis is a common pathology which can lead to complications of varying severity, even the loss of a testicle. The knowledge of the sonographic signs of each one of these entities will allow us to establish an early and reliable diagnosis, as well as the choice of adequate conservative or surgical treatment.
References


