Infection of the epididymis by *Ureaplasma urealyticum*

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SUMMARY *Ureaplasma urealyticum* organisms (ureaplasmas) were isolated from the urethra and epididymal aspirate of a man aged 24 who had acute right sided epididymitis. No other micro-organisms were detected, and he had no chlamydial antibody response. A fourfold antibody response to the epididymal ureaplasma isolate was detected by two methods, however, and the patient responded clinically to doxycycline, to which the ureaplasma isolates were susceptible in vitro. These findings suggest that *U urealyticum* had a causative role.

Ureaplasmas, found in the genitourinary and respiratory tracts of some mammalian and avian species, are unique among the order Mycoplasmatales in their ability to metabolise urea. The genus *Ureaplasma* contains three species, ureaplasmas found in man being classified in the genus and species, *U urealyticum*. The organisms are found in the genitourinary tract of some healthy men,¹ but there has been cumulative evidence, which has become increasingly difficult to refute, that they cause a proportion of cases of non-gonococcal urethritis,¹ and they certainly do so in patients with impaired immunity.² The possibility that *U urealyticum* might be implicated in other conditions of the genitourinary tracts of men has often been discussed. Indeed, Harnisch and colleagues suggested it more than a decade ago as a possible cause of acute epididymitis,³ but the same group of workers failed to find support for the hypothesis in their subsequent studies based on epididymal aspiration.⁴ Their findings indicated that epididymitis is caused mainly by *Chlamydia trachomatis* in patients younger than 35 and by urinary tract pathogens in older patients. Other studies have not provided evidence to refute these findings,^{5,6} although they were limited to the possible role of *C trachomatis* and have not entailed epididymal aspiration. Recently, Doble and colleagues have undertaken the first study of acute epididymitis in the United Kingdom, in which epididymal aspirates have been examined microbiologically.⁷ We report in detail the findings in one case.

Case report

A man aged 24 presented to the accident and emergency department of St Mary's Hospital with a two day history of testicular pain and swelling. He had no discharge or dysuria or any history of sexually transmitted disease. On examination, he had scrotal swelling with a palpably enlarged right testis and epididymis, the latter being extremely tender. Rectal examination showed a normal prostate. The remainder of the examination showed no abnormality. Urethral swabs and a midstream urine sample were obtained and examined microbiologically as outlined below. In view of the possibility of testicular torsion, the patient underwent exploration of the testis under general anaesthesia. The operative findings were of an enlarged viable testis with no evidence of torsion. The epididymis was distended and severely hyperaemic, and 1.0 ml of turbid fluid was aspirated for microbiological assessment. The patient was then subjected to transrectal prostatic ultrasound examination, after which he was treated with doxycycline 100 mg twice a day for one week and 100 mg daily for five weeks. He made an uneventful recovery.

MICROBIOLOGICAL INVESTIGATIONS AND FINDINGS

U urealyticum organisms were isolated from an urethral swab and the epididymal aspirate in a conventional manner, the specimens being diluted serially in liquid medium.⁸ More organisms were found in the epididymal aspirate ($\geq 10^4$ colour changing units (ccu/ml) than in the urethral swab (10^3 ccu/ml) (table). *C trachomatis* was sought in urethral and aspirate specimens by direct immunofluorescence using a monoclonal antibody (MictoTrak, Syva, UK),⁹ but was not detected. Nor was there evidence in such

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Table Results of microbiological investigations of a man with epididymitis

Stage of disease	Sites yielding ureaplasmas (ccu/ml)	Susceptibility of ureaplasmas to doxycycline (MIC)	Titre of antibody to <i>Ureaplasma urealyticum</i> by:	
			Microimmunofluorescence	Metabolism inhibition
Acute	Urethra (10 ³) Epididymis ($\geq 10^6$)	0.125 µg/ml 0.125 µg/ml	1/16	1/16
Convalescent			1/64	1/64

ccu = colour changing units; MIC = minimum inhibitory concentration.

specimens of *Neisseria gonorrhoeae*, *Mycoplasma hominis*, or anaerobes, and urinary tract pathogens were not found in the urine.

Serological studies supported the finding of *U. urealyticum* in the epididymis. The epididymal isolate was grown and used as antigen in an immunofluorescence test to detect IgG and IgM antibody.¹⁰ A fourfold rise in the titre of IgG antibody to *U. urealyticum* was shown—it was 1/16 in serum obtained in the acute phase and 1/64 in serum obtained one month later in the convalescent phase. A comparable serological response was seen when the metabolism inhibition test was used,¹¹ antibody titres of 1/16 and 1/64 being found in the corresponding sera (table). Antibody to *C. trachomatis* could not be detected in these sera by microimmunofluorescence.¹²

The susceptibility of the ureaplasma isolates to doxycycline was assessed by a microdilution broth method.¹³ Both isolates were sensitive, the minimum inhibitory concentration being 0.125 µg/ml (table).

Discussion

We detected *U. urealyticum* organisms in the epididymal aspirate of only one of 24 patients with acute epididymitis, six of whom yielded them from the urethra.⁷ The occurrence of the organisms in both anatomical sites, however, and an even larger number in the aspirate than in the urethra, indicated that there was canalicular spread. This finding, together with an antibody response detected by two methods, and therefore not spurious, shows unquestionably that in this case there was deep seated ureaplasma infection, and not just colonisation. The failure to detect any other micro-organism, including *C. trachomatis*, and the rapid clinical response to prolonged treatment with doxycycline, to which the ureaplasmas were sensitive *in vitro*, also suggested that *U. urealyticum* had a causative role. The prostatic ultrasound scan showed bilateral mid range echoes. Though these may indicate fibrotic changes, they may also indicate an inflammatory response,¹⁴ possibly due to prostatic infection. We felt that this was sufficient justification for treating the patient for longer than usual. Undertaking aspiration studies routinely on patients with acute epididymitis to search for ureaplasmas is prob-

ably not warranted, but it would be worthwhile undertaking ureaplasma serology on paired sera from any patient with epididymitis who has ureaplasmas in the urethra. A serological response would suggest a more deep seated infection and the possible implication of these organisms.

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