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# Unusual presentation of seminal vesiculitis in an infertile man

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*Seminal vesiculitis is generally not investigated in infertile men, since it is uncommon and often nonspecific in signs and symptoms. In this article, the author reports an unusual presentation of seminal vesiculitis, incidentally diagnosed in a man referred for semen analysis to investigate infertility. Analyses of physical properties of the ejaculate (coagulation, liquefaction, volume, viscosity and pH) and of biochemical markers of*

*the prostate (total calcium and zinc) and seminal vesicle (fructose and inorganic phosphorus) detected a dysfunction of the seminal vesicles that was subsequently diagnosed as vesiculitis using transrectal ultrasound. After treatment with a single 500-mg dose of oral ciprofloxacin, the patient was referred again for semen analysis. The analysis showed considerable improvement of the seminal vesicle function. The clinical significance of these findings is discussed.*

**Key Words:** semen, biochemistry, semen analysis, infertility, seminal vesicles, vesiculitis

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## Introduction

Seminal vesiculitis is uncommon in clinical urology and it may be clinically nonspecific in symptoms, or it may present secondarily to urethritis, prostatitis and/or epididymitis.<sup>1</sup> Its diagnosis is difficult and very often it is made based on clinical findings (painful ejaculation, perineal and scrotal pain, hypospermia and hemospermia) and diagnostic imaging procedures.<sup>2,3</sup> Seminal vesiculitis is an unusual condition and it is seldom detected in infertile men.

The current study reports data from semen analyses of a man referred for routine investigation of infertility, in whom a seminal vesiculitis was diagnosed. Records from pre- and post-treatment semen analysis are presented and discussed.

## Material and methods

A 32-year-old patient was referred to the Semen Research Unit for routine semen analysis to investigate infertility. The patient had a history of infertility with

2 years of inability to achieve a pregnancy with unprotected intercourse. He presented with a clinical finding of varicocele that was subsequently confirmed by Doppler ultrasound. Additionally, he had a history of two previous semen analyses, characterized by the presence of hypospermia, normospermia and teratoasthenospermia (data not reported). On the other hand, the patient did not present with any complaint of painful ejaculation or hemospermia, and he did not have a history of previous urethritis, epididymitis and/or prostatitis.

The semen specimens were collected by masturbation at the laboratory, after 5 days of sexual abstinence and were analyzed for physical properties (coagulation, liquefaction, volume, viscosity and pH), prostate biochemical markers (total calcium and zinc) and seminal vesicles biochemical markers (fructose and inorganic phosphorus), which were evaluated according to previously described procedures.<sup>4</sup> Furthermore, the study evaluated the sperm concentration, vitality, rapid progressive motility (a), total progressive motility (a + b), percentage of morphologically normal spermatozoa (including strict Kruger criteria), leukocyte concentration, mixed agglutination reaction (MAR)-test and sperm membrane integrity hypoosmotic swelling test (HOST), according to the recommendations of the World Health Organization (WHO) protocol.<sup>5</sup>

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## Results

In the first semen analysis – a quick evaluation of the semen specimen as soon as it was ejaculated – a very poor coagulation was observed, characterized by the presence of a single microcoagulum that quickly liquefied in 5 minutes. Abnormal results were also remarkable in semen volume, viscosity, pH, and levels of biochemical markers, which strongly suggested abnormal seminal vesicle function, Table 1.

After the first examination, the patient was clinically treated with a single 500-mg dose of oral ciprofloxacin, after a seminal vesiculitis was diagnosed using transrectal ultrasound criteria that included the investigation of enlargement (dilatation) and asymmetry, thickening, and calcification.<sup>6</sup> Fifteen days after this treatment, he was referred to the Semen Research Unit for a second semen analysis; those findings showed a considerable improvement of seminal vesicle function, Table 1.

## Discussion

This case emphasizes the importance of a detailed analysis of each semen parameter in an infertility investigation. Even if the presence of some abnormal sperm characteristics is taken into account, possibly related to the early diagnosis of varicocele in this patient, the analysis of the physical properties of the ejaculate and of biochemical markers of the prostate and seminal vesicles played a pivotal role in identifying the disorder in the secretory activity of the seminal vesicles, which was later diagnosed as seminal vesiculitis.

Seminal vesicles are of paramount importance for semen physiology, since their fluids contribute from 46% to 80% of the ejaculate.<sup>7</sup> They provide support to sperm metabolism, motility, chromatin stability, and function – with their biochemical products such as fructose, electrolytes, prostaglandin, ascorbic acid, zinc ligands, and protein residues originating from semen coagulum.<sup>8</sup> Abnormal seminal vesicle function can alter these fluids' biochemical composition, adversely affecting the sperm function, after

TABLE 1. Semen parameters in an infertile man with seminal vesiculitis

Seminal parameter	Reference values	Pre-treatment	Post-treatment
Sperm concentration	> 20 x 10 <sup>6</sup> /ml	122 x 10 <sup>6</sup> /ml	24 x 10 <sup>6</sup> /ml
Vitality	> 60%	49%	51%
Motility (a)	≥ 25%	2%	5%
Motility (a + b)	≥ 50%	7%	25%
Normal morphology	≥ 15%	1%	3%
HOST	≥ 60%	39%	42%
MAR-test	≤ 10%	4%	16%
Coagulation	Moderate or intense	Poor *	Moderate
Liquefaction	10 min-60 min	5 min	50 min
Volume	2.0 ml to 5.0 ml	1.0 ml	3.2 ml
Viscosity	Normal	Poor	Normal
pH	7.3-7.8	6.5	7.0
Total calcium	200 µg/ml-400 µg/ml	1000 µg/ml	450 µg/ml
Zinc	100 µg/ml-200 µg/ml	200 µg/ml	134 µg/ml
Fructose	1.8 mg/ml-4.0 mg/ml	1.8 mg/ml	3.9 mg/ml
Inorganic phosphorus	700 µg/ml-1100 µg/ml	320 µg/ml	1,068 µg/ml
Leukocytes	< 1.0 x 10 <sup>6</sup> /ml	0.05 x 10 <sup>6</sup> /ml	0.01 x 10 <sup>6</sup> /ml
Bacteriospermia	-	Present	Lack

HOST = hypoosmotic swelling test

\*Presence of only one micro-coagulum

ejaculation. Thus, the analysis of physical properties of the ejaculate and of gland biochemical marker proves fundamental in determining the diagnosis.

The presence of only one micro-coagulum in the first seminal sample (had it been collected at home, the coagulation and liquefaction would not have been noted) and the abnormalities in seminal volume, viscosity, and pH showed that seminal vesicle function was significantly affected (apparently, the patient's semen consisted predominantly of prostatic fluid) and improved substantially after treatment, as shown by the same parameters analyzed in the second specimen. This fact suggests that seminal vesiculitis probably causes incomplete drainage of the seminal vesicle fluids into the ejaculate, causing hypospermia and the prevalence of prostatic fluid.

It is also noteworthy that leukocyte concentrations in both specimens were not above the normal reference values given in the WHO manual ( $> 10^6/\text{ml}$ ), although seminal vesiculitis usually causes pyospermia.<sup>1,9</sup> It is also thought that this might be due to the incomplete drainage of seminal vesicle fluids into the ejaculate. On the other hand, semen specimens presented bacteriospermia only in the first specimen, despite the presence of hypospermia. This finding raises the possibility that the increased bacterial flora could be a result of urethral contamination, since *Chlamydia trachomatis* has been described as the main cause of seminal vesiculitis in men under 40 years of age.<sup>9</sup> (Microbiological examination of the semen specimens, including the investigation of *Chlamydia trachomatis*, was not performed in this study). Furthermore, data from Table 1 did not provide convincing proof, because the Mar-test was positive in the seminal sample collected after treatment. This could be attributed to two causes: 1) inadequate amount of seminal vesicle fluids in the ejaculate, pre-treatment and 2) a late immunological reaction, after treatment. However, such hypotheses remain unclear in the current study.

This case shows that seminal vesiculitis can be diagnosed in infertile men, although it is uncommon in patients seen in infertility clinics and it is generally nonspecific in signs and symptoms. Indeed, apart from hypospermia, this patient did not present with any symptoms, not even a previous history of genital infection. So, the diagnosis was only possible due to the help of semen analysis and further clinical investigation using transrectal ultrasound of the prostate (TRUS). It is also worth noting the quick response to treatment with ciprofloxacin was detected in the semen parameters analyzed.

In summary, this study underscores the significance of analyzing the physical properties of the ejaculate and

biochemical markers of the prostate and seminal vesicles to help determine the diagnosis of seminal vesiculitis. In the patient's first semen analysis, these properties played a primary role in the detection of abnormal seminal vesicle function, which led to the seminal vesiculitis diagnosis. After treatment, the same parameters were also meaningful to determine the improvement of seminal vesicle function. Above all, these semen parameters are poorly explored in infertility clinics, since semen analysis focuses particularly on the evaluation of sperm characteristics and function. However, although infrequent and underreported in the literature,<sup>10</sup> seminal vesiculitis, together with prostatitis and/or epididymitis exercise a negative impact on sperm output and cause a leukocyte-related reactive oxygen species (ROS) overproduction,<sup>11</sup> impairing men's reproductive capacity. Should the presence of hypospermia be the first signal to investigate seminal vesiculitis in infertile men? □

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