



## Andrology and Fertility

## Retrograde Ejaculation: A Rare Presenting Symptom of Type 1 Diabetes Mellitus

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## ABSTRACT

A 19 year old presented with a progressive decline in ejaculate volume over 2 weeks, followed by a complete absence of ejaculate emission. A post-ejaculatory urine specimen demonstrated spermatozoa confirming a diagnosis of retrograde ejaculation. Investigations revealed a raised blood glucose level of 24.5 mmol/L and HbA1c >15%, with positive tests for anti-GAD antibodies and anti-IA2 antibodies consistent with a diagnosis of Type 1 diabetes mellitus. Retrograde ejaculation in diabetes is associated with autonomic neuropathy and is a late feature of the disease. This case is unique with retrograde ejaculation being the primary presenting symptom of Type 1 diabetes mellitus.

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## Introduction

Retrograde ejaculation (RE) is the abnormal passage of ejaculate into the bladder after orgasm. This is associated with dysfunction of the internal urethral sphincter mechanism which can be caused by autonomic neuropathy or iatrogenic damage to sympathetic nerves or the bladder neck. Diabetes mellitus can cause the microvascular complication of neuropathy, including autonomic neuropathy, which can result in retrograde ejaculation. This is typically a late symptom of the disease. We present a rare case where retrograde ejaculation was the initial presenting symptom for Type 1 diabetes mellitus.

## Case presentation

A 19 year old male with no prior past medical history presented for investigation of a complete absence of ejaculate after orgasm. Over a 2 week period, the patient had noticed a progressive decline in ejaculate volume. This was followed by a total absence of ejaculate emission which had persisted for several months before review. He was able to maintain normal erections and achieve normal

orgasm. There was no history of hematuria, bladder outlet obstruction symptoms or urinary tract infections. Examination revealed a mild phimosis but no other structural abnormality of the penis or testes.

A post-ejaculatory urine microscopy demonstrated spermatozoa within the urine specimen, confirming the diagnosis of retrograde ejaculation. A renal tract ultrasound demonstrated debris within the bladder.

A week later he was admitted to hospital for investigation of progressive peripheral sensory neuropathy, without motor involvement of his lower limbs, which had developed subsequent to RE. Extensive investigations of his peripheral neuropathy were performed which revealed a random serum glucose level of 24.5 mmol/L and an HbA1c of >15% (normal range 3.5%–6.5%), diagnostic of diabetes mellitus. Other relevant investigations were negative (Table 1). His anti glutamic acid antibody (GAD) and islet antigen 2 (IA2) antibodies were positive, and c-peptide and insulin levels were undetectable, consistent with insulin deficiency and Type 1 diabetes. There was no family history of diabetes, and no evidence of microalbuminuria or diabetic retinopathy at diagnosis. He was commenced on a basal-bolus regime of insulin for his Type 1 diabetes and amitriptyline for his peripheral neuropathy with good effect.

## Discussion

Retrograde ejaculation (RE) is defined as the emission of ejaculate which travels retrograde into the bladder after deposition into

Abbreviation: RE, retrograde ejaculation.

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**Table 1**  
Summary of investigations and results for the patient's RE and peripheral neuropathy

Investigation	Results	Reference range
Post-ejaculatory urine microscopy	Spermatozoa present	
Renal tract ultrasound	Debris in bladder, no structural abnormalities	
MRI brain and spine	NAD	
Nerve conduction studies	Sensorimotor neuropathy of legs (moderate severity)	
Serum glucose (mmol/L)	24.5	3.4–7.8
HbA1c	>15% (143 mmol/mol)	4%–6% (20–42 mmol/mol)
IA2 antibodies (kIU/L)	3.1	< 1.0
Glutamic acid decarboxylase antibodies (kIU/L)	7010	<25.0
C-Peptide	Undetectable	
Insulin	Undetectable	
Creatinine kinase	81	30–200
Serum B12 (pmol/L)	694	138–652
Serum folate (nmol/L)	36.6	7–46.6
Iron studies	Normal	
Vitamin D (nmol/L)	65	50–140
Rheumatoid factor (IU/mL)	<15	<30
TSH (mIU/L)	1.39	0.4–3.5
ANA	Negative	
ANCA	Negative	
IPEG	No monoclonal bands	
HLA-B27	Negative	
Syphilis	Negative	
HIV	Negative	
Hepatitis B and C	Negative	
TB gamma interferon	Negative	

the posterior urethra following orgasm. This is distinct from anejaculation where there is a complete absence of ejaculate in the posterior urethra after orgasm. Patients may report cloudy urine following orgasm and diagnosis of RE is confirmed by the presence of spermatozoa in a post-ejaculatory urine sample. RE can either be partial (with a decreased ejaculate volume, as seen initially in our case) or complete (with absence of any ejaculate following orgasm).

RE occurs due to dysfunction of the internal urethral sphincter at the bladder neck. During normal ejaculation, the internal urethral sphincter contracts under  $\alpha$ 1-adrenergic sympathetic control, causing the bladder neck to close with high pressure. The ejaculate then follows the path of least resistance, thus passing antegrade. Interference with this ejaculatory reflex results in the bladder neck being unable to close with high pressure and thus resulting in a low pressure path for the ejaculate to pass into the bladder.<sup>1,2</sup>

Diabetes can cause autonomic neuropathy which affects the sympathetic fibers arising from the superior hypogastric plexus which normally mediate contraction of the internal urethral sphincter during ejaculation.<sup>1,2</sup> Damage to these sympathetic nerves during pelvic or spinal surgery can also cause RE. Medications such as sympathetic antagonists (particularly  $\alpha$ -antagonists) may also contribute to RE.

The true prevalence of RE in the general population is unknown, though complete absence of ejaculation has been reported in up to 5% of men aged 50–80 years.<sup>2</sup> RE has a strong association with diabetes, but RE and autonomic neuropathy are rarely presenting symptoms of the diagnosis of diabetes.<sup>1,2</sup> In a small case-control study, the prevalence of retrograde ejaculation was estimated to be approximately 34% in men with diabetes aged between 35 and

55 years, though other studies of young male diabetics have estimated RE and AE to be present in only 6% of patients.<sup>2</sup> There are no studies comparing the rates of RE in Type 1 vs Type 2 diabetes mellitus. Men with RE tend to have had a diagnosis of diabetes mellitus for longer than those without RE (20 years vs 13 years).<sup>3</sup> This implies that the autonomic neuropathy of diabetes associated with retrograde ejaculation tends to be a late presenting feature. RE and anejaculation are amongst the most common causes of infertility in diabetic men.<sup>4</sup> Our patient presented with features of autonomic neuropathy, followed by the development of peripheral sensory neuropathy prior to a diagnosis of Type 1 diabetes. To the author's knowledge, this is the first report of retrograde ejaculation as the presenting symptom of diabetes mellitus.

Treatment of RE should first include cessation of any sympathetic blocking agents. Medical treatment with sympathomimetics with  $\alpha$ -adrenergic action, such as imipramine and pseudoephedrine, have been shown to offer benefit for some patients with RE in diabetes.<sup>1,4,5</sup> These agents can be used individually or in combination.<sup>5</sup> In a small non-controlled study of 33 men, imipramine or pseudoephedrine were able to produce antegrade ejaculation in approximately 40% of patients. This increased to 61% of patients when these agents were used in combination.<sup>5</sup> For fertility issues with retrograde ejaculation which are non-responsive to medical treatment, assisted reproductive techniques may be of benefit, with sperm being harvested directly from testis or retrieved from the bladder.<sup>4</sup> Finally it is imperative to monitor and screen for other autonomic neuropathic complications of diabetes, as they may mask the sensation of hypoglycaemia and complicate the treatment of diabetes.

## Conclusion

Our case is unique with retrograde ejaculation as the primary presenting symptom of Type 1 diabetes mellitus. To the authors knowledge there have been no previous reports of retrograde ejaculation as a presenting symptom of diabetes. While previous studies have shown that retrograde ejaculation tends to be a late presenting symptom of diabetes mellitus, our case highlights that screening for diabetes is essential in young patients presenting with retrograde ejaculation.

## Consent

Written consent was obtained from the patient for this case report.

## Conflict of interest

The authors have no conflicts of interest to disclose.

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