



Pan African Urological Surgeons' Association

**African Journal of Urology**

[www.ees.elsevier.com/afju](http://www.ees.elsevier.com/afju)  
[www.sciencedirect.com](http://www.sciencedirect.com)



## Review

# Trigonalgia: An overlooked cause of bladder pain



**S. Aminu**

*George Eliot Hospital, Nuneaton, Warwickshire, UK*

Received 5 February 2015; accepted 19 May 2015

Available online 4 December 2015

### KEYWORDS

Bladder pain;  
Pelvic pain;  
Trigonitis;  
Trigonalgia

### Abstract

Bladder pain is a cause of chronic pelvic pain, which constitutes a common presentation in urology outpatient consultation, especially among females. Some endoscopic features of the trigone observed during cystoscopy was correlated with mild to moderately bothersome bladder pain, termed trigonalgia. This is due to peculiarity of the trigonal anatomy from the rest of bladder, especially with the highest concentration of afferent nerves. Research focused on the trigone is worthwhile.

© 2015 Pan African Urological Surgeons' Association. Production and hosting by Elsevier B.V. All rights reserved.

## Introduction

Bladder pain is a very important type of chronic pelvic pain syndrome. A significant part of outpatient urological consultation involves various types of chronic pelvic pain syndrome among both men and women. Such is the significance of chronic pelvic pain that the first international conference on chronic pelvic pain syndrome was held in 2013 at Amsterdam in the Netherlands. Phenotype mapping of urologic patients with painful syndrome is important in planning effective therapy due to the heterogeneity of the conditions [1]. A large study involving analysis of 1016 gynaecological patients who had laparoscopy and cystoscopy for chronic pelvic pain has shown a mean prevalence of 61% due to bladder pain syndrome excluding pregnancy and cancer [2].

Bladder pain denotes painful experience arising from the bladder from various known and unknown aetiological factors. The most significant factor associated with pathology in the bladder is interstitial cystitis (otherwise known as bladder pain syndrome), which is a non-infectious inflammation of the mucosal and sub mucosal lining of the bladder. Other significant aetiological factors related directly to the bladder includes acute and chronic bacterial infections of the bladder, acute and chronic infestations as in bilharzias where it is prevalent, cystolithiasis [3], endometriosis involving the bladder, carcinoma in situ, pelvic trauma involving the lower genitourinary tract and foreign bodies in bladder. Aetiological factors not directly related to the bladder includes acute and chronic prostatitis/pelvic pain syndrome in men, gynaecological, immunological, psychological [4], neurological [5] and hormonal factors (Table 1).

## Anatomy of the trigone

The anatomy of the trigone consists of the superficial trigone which is a continuation of the inner longitudinal layer of each ureter and

E-mail address: [sani\\_aminu@hotmail.com](mailto:sani_aminu@hotmail.com)

Peer review under responsibility of Pan African Urological Surgeons' Association.

<http://dx.doi.org/10.1016/j.afju.2015.05.004>

1110-5704/© 2015 Pan African Urological Surgeons' Association. Production and hosting by Elsevier B.V. All rights reserved.

**Table 1** Etiological factors in bladder pain.

Direct	Indirect (due to contiguity or radiation)
Acute and chronic bacterial cystitis	Acute and chronic prostatitis
Interstitial cystitis	Pelvic inflammatory disease
Cystolithiasis	Pelvic tumours
Carcinoma in situ of bladder	Endometriosis of pelvic tissues and organs
Foreign body irritation	Hormonal
Trauma, vesico vaginal and vesico rectal fistula	Neurological
Endometriosis of bladder	Psychological
Acute and chronic schistosomiasis	Immunological

extends down to the bladder neck and urethra, while the Waldeyer's sheath and distal outer longitudinal muscle of the ureter continues as the deep trigone. Thus the boundaries of the trigone are the two ureteric orifices and the internal urethral meatus. However, in the male the superficial trigone extends down to the verumontanum and in females down to the external urethral meatus [6].

In terms of innervation of the trigone, a dense afferent plexus is found in the sub urothelium of the trigone and bladder neck [7]. A histochemical study of the trigone showed similar concentration of intramural neurones. Using histochemical dye fast blue as well as by coupling retrograde tracing and double-labelling immunofluorescence methods the nerves were traced extramurally. The highest concentration was found in the pelvic plexus. Substantial concentrations were also found in the sympathetic trunk ganglions and caudal mesenteric ganglion [8].

### Clinical presentation of trigonalgic pain

Trigonalgic pain is most common in middle aged women and sometimes in elderly women after resolution of acute bacterial infections of the bladder leaving residual chronic trigonitis. We have observed that patients typically complain of persistent bladder pain that radiates to the urethra. The pain is described as a burning pain or nagging discomfort. Patients map it with their four fingers as deep to the symphysis pubis as possible and vertically down the urethra, unlike interstitial cystitis pain, which is usually mapped in a horizontal configuration in the lower abdomen. Unlike interstitial cystitis also, the pain is worse on passing urine. It could be confused with acute bacterial cystitis only that urine dipstick reveals neutrophils and red blood cells, but usually no nitrites. In most patients it usually follows resolution of an acute cystitis and patients feel as if it is lingering cystitis. However, urine cultures reveal no growth but plenty of epithelial cells and some leucocytes and red cells. Additionally, patients have overactive bladder symptoms usually without incontinence. In Men, the pain is described as deep in the pelvis and radiates to the tip of penis. Unlike typical chronic prostatitis it does not cause vague symptoms like testicular, groin and perineal aches. A lot of these patients are treated with various courses of antibiotics, but pain and LUTS lingers on.

### Endoscopic features associated with trigonalgic pain

During urethroscopy, the trigone shows some various features usually squamous metaplastic changes or cystitis glandularis

associated with the above. There is a type of squamous metaplasia which is greyish, especially when trigone is seen backwards with J manoeuvre. The appearance is like greyish ash sprinkled on the ground. Patients with these features often have burning pain. The ones with the typical whitish fluffs of squamous metaplasia on the trigone which is easily dislodged with a jet of water as well as those with cystica glandularis of the trigone have the nagging discomfort. In men, they greyish pattern of squamous metaplasia is seen involving the trigonal mucosa that is sometimes in cooperated by intravesical protruding prostate. The rest of the bladder is usually normal and unlike in recent resolution of infection involving the other parts of the bladder where blotches of redness is noticeable.

### Hypothesis and conclusion

The hypothesis here is that patients who have acute cystitis involving the trigone sometimes get lingering chronic inflammation of the trigone causing chronic trigonitis, and since the trigone has the highest concentration of afferent nerve endings in its submucosa then a cascade of chronic pain presenting as trigonalgia is initiated.

A randomized control study comparing outcomes in patients suspected to have trigonalgia on conventional treatment with those on therapy targeting the trigone is required. Conceivably, the result may show that the trigone is not an innocent bystander in bladder pain.

### Conflict of interest

There is no conflict of interest to declare.

### Acknowledgement

I appreciated the advice of Dr. Samuel Osaghae, Consultant Urologist at Lagoon Hospital, Lagos, Nigeria, during preparation of this article.

### References

- [1] Kartha GK, Kerr H, Shoskes DA. Clinical phenotyping of urologic pain patients. *Curr Opin Urol* 2013;23(6):560–4.
- [2] Tirlapur SA, Kuhrt K, Chaliha C, Ball E, Meads C, Khan KS. The 'evil twin syndrome' in chronic pelvic pain: a systematic review of prevalence studies of bladder pain syndrome and endometriosis. *Int J Surg* 2013;11(3):233–7.
- [3] Keller J, Chen YK, Lin HC. Association of bladder pain syndrome/interstitial cystitis with urinary calculus: a nationwide population-based study. *Int Urogynecol J* 2013;24(April (4)):565–71.
- [4] Birder LA. Nervous network for lower urinary tract function. *Int J Urol* 2013;20(1):4–12.
- [5] Alappattu MJ, Bishop MD. Psychological factors in chronic pelvic pain in women: relevance and application of the fear-avoidance model of pain. *Phys Ther* 2011;91(10):1542–50.
- [6] Hinman F, editor. Bladder and ureterovesical junction: structure and function in atlas of urological anatomy. Philadelphia: W.B. Saunders; 1993. p. 334–7 [chapter 13].
- [7] Anderson KE. Bladder activation: afferent mechanisms. *Urology* 2002;59(May (5 (Suppl. 1))):43–50.
- [8] Ragionieri L, Botti M, Gazza F, Sorteni C, Chiochetti R, Clavenzani P, et al. Localization of peripheral autonomic neurons innervating the boar urinary bladder trigone and neurochemical features of the sympathetic component. *Eur J Histochem* 2013;57(May (2)):e16, <http://dx.doi.org/10.4081/ejh.2013.e16>.