

Correspondence

Neuroanatomy of the human striated urethral sphincter

Sirs,

We would like to congratulate Dr Zvara *et al.* for their considerable work exposing the detailed neuroanatomy of the human striated urethral sphincter [1]. There is no doubt that the study will bring light upon unexplained loss, and more excitingly, persistence of urethral sphincter function in many cases.

A recent patient, a 9-year-old boy, admitted following an accident, was operated upon on arrival in our department to repair his extensive open perineal injury. The appearance of his perineum was quite similar to the picture of cadaveric dissection in Fig. 1 of the above-mentioned article [1]. The bulbospongiosus muscle was completely exposed, and detached from the anterectal tissues. The main trunk of the pudendal nerve was visible and moved freely on both sides between oedematous and haemorrhagic muscles. Although a complete tracing of the visible nerves to target organs was not attempted, the normal functioning of the urethral sphincter in future seemed unlikely. To our surprise, the boy voided normally after removal of his urethral catheter. There was no abnormal finding in the urodynamic evaluation performed at the third post-operative month. Therefore, it is tempting to explain the situation by the existence of an extrapudendal innervation of the striated urethral sphincter in this particular case, after reading the article by Zvara *et al.* [1].

The only criticism regarding this interesting study is that it is so clear and demonstrative that, unintentionally it may encourage surgeons to feel more comfortable during pelvic dissections as if there were a 'spare' nerve for the urethral sphincter.

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1 Zvara P, Carrier S, Kour NW, Tanagho EA. The detailed neuroanatomy of the human striated urethral sphincter. *Br J Urol* 1994; 74: 182-7

Reply

Sirs,

We appreciate the thoughtfulness of Drs Ulman, Avanoğlu and Gökdemir to share with us their experience in a recent perineal trauma patient, which exposed the essential anatomy of the pudendal nerve and its various branches to the perineum and to the anal sphincter and urinary sphincter. They confirmed by their observation that there is truly dual innervation to the external sphincter, one inside the pelvis and the other is from outside. We appreciate their kind remarks as well as their criticism, but I am sure experienced surgeons will take advan-

tage of this knowledge to avoid any injury or damage to the pudendal nerve and its branches whenever feasible.

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Sirs,

Dr Tanagho *et al.* published an extremely good anatomical article on the innervation of the striated urethral sphincter [1]. The combination of colour photographs and line drawings is superb in conveying the message that the striated urethral sphincter is innervated from inside and outside the pelvic floor.

Until now the Tanagho group have proposed all innervation for the human striated urethral sphincter to be via the somatic nerves [2]. Our Leiden group has always proposed innervation to be via the pelvic plexus [3,4].

We studied 10 male and female cadavers [3], the Tanagho group six male cadavers [1]. The differences are:

	Tanagho group	Leiden group	
	Male	Male	Female
Pudendal nerve	S2, S3, S4	S2, S3	S1, S2, S3
Pelvic plexus	S2, S3, S4	S2, S3, S4	S3, S4

Therefore, does the spinal ventral rami constitute the pudendal nerve and the pelvic plexus [3], which is an important factor in the innervation of the human striated urethral sphincter?

Moreover, it is a pity that the tissue indicated as the pudendal 'branches to ventral sphincter' (Fig. 1) was not studied electron microscopically as we have done [3-5].

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1 Zvara P, Carrier S, Kour NW, Tanagho EA. The detailed neuroanatomy of the human striated urethral sphincter. *Br J Urol* 1994; 74: 182-7

2 Juenemann KP, Lue TF, Schmidt RA, Tanagho EA. Clinical significance of sacral and pudendal nerve anatomy. *J Urol* 1988; 139: 74-80