



Macroscopic and histotopographic study of the deep transverse perineal muscle (musculus transversus perinei profundus) in elderly Japanese

Futoshi Nakajima^a, Atsushi Takenaka^b, Eiichi Uchiyama^c, Fumitake Hata^a, Daisuke Suzuki^c, Gen Murakami^{c,*}

^a*Division of Gastro-enterologic Surgery, Eniwa Dai-ichi Hospital, Eniwa, Japan*

^b*Department of Urology, Kobe University School of Medicine, Kobe, Japan*

^c*Department of Anatomy, Sapporo Medical University School of Medicine, South 1, West 17, Sapporo 060-8556, Japan*

Received 20 February 2006; accepted 19 June 2006

KEYWORDS

Deep transverse perineal muscle;
Urogenital diaphragm;
External urethral sphincter;
Urethral rhabdospincter;
Bulbourethral gland

Summary

Although the deep transverse perineal (DTP) muscle is well known as the core of the urogenital diaphragm, most recent studies have denied its existence. In students' dissection classes, we cut the surfaces of 93 macroscopically identified urogenital diaphragms (59 male cadavers) and found the distinct sheet-like DTP in 24.7% (23 of 93 sides). Another 17 cadavers (mean age 81.4 years) were used for histology. In histology of 12 males, we consistently identified the DTP as a small muscle bundle immediately lateral to the bulbourethral gland. Thus, the macroscopically unclear morphology of the DTP (19.4%, 18 of 93 sides) seemed to be overestimated. The histologically proven DTP was continuous with a "tail" or inferolateral protrusion of the external urethral sphincter or urethral rhabdospincter. However, the histology revealed that a sheet-like DTP was not usual (16.7%, two of 12 cadavers). Likewise, in histology of five females, the tail always continued to a muscle mass immediately lateral to the greater vestibular gland and far dorsal to the external urethral sphincter. Thus, the female topohistology seemed to be consistent with the male unclear DTP. Because of the limited incidence of a sheet-like DTP and the unclear fascial structure containing numerous vessels around the rather small DTP, in most elderly cadavers the urogenital diaphragm was likely to be a macroscopic entity rather than a histologic one. However, we believed that the histologically proven

Abbreviations in figures: BP, bulbus penis; BS, bulbospongiosus muscle; BUG, bulbourethral gland (Cowper's gland); CP, crus penis; DTP, deep transverse perineal muscle (*M. transversus perinei profundus*); EUS, external urethral sphincter or urethral rhabdospincter; IC, ischiocavernosus muscle; LA, levator ani muscle; PN, pudendal nerve

*Corresponding author. Tel.: +11 611 2111; fax: +81 11 611 4288.

E-mail address: chisa@sapmed.ac.jp (G. Murakami).

DTP was present in elderly men and women even if it had changed as a result of degeneration with aging.

© 2006 Elsevier GmbH. All rights reserved.

Introduction

The deep transverse perineal muscle (DTP) or *musculus transversus perinei profundus* became well known as the core of the urogenital diaphragm after Henle (1873). According to an excellent review by Fritsch et al. (2004), the DTP is present in men but absent in women. However, their histological demonstrations of the DTP were limited to those using fetuses. To the best of our knowledge, Courtney (1950) initially reported that the DTP does not exist and that the urogenital diaphragm is the result of the artist's imagination. The doubt was also postulated by Warwick et al. (1973) in their urodynamic study as well as by Oelrich (1980) in his histological study using fetuses. Recently, the three-dimensional columnar architecture of the human male external urethral sphincter (urethral rhabdosphincter) has been intensively described histologically by urologists and anatomists (Kokoua et al., 1993; Strasser et al., 1996; Thiele et al., 1997; Kaye et al., 1997; Burnett and Mostwin, 1998; Dorschner et al., 1999; Murakami et al., 2002). Notably, except for our group (Murakami et al., 2002) and Kokoua et al. (1993), these researchers denied the existence of the urogenital diaphragm and DTP. According to his magnetic resonance imaging studies, the strictest criticism against the existence of the urogenital diaphragm was provided by Myers (2001), who developed a safe treatment of ventrally located veins in retropubic radical prostatectomy (bunching technique; Myers, 1989). He stated that "there is not even a hint of what might be called Henle's artifact, his diaphragma urogenitale."

Why did most researchers not find these structures? There seems to be a logical pitfall: "a flat DTP has been believed to make up the external urethral sphincter. However, this sphincter is not flat but highly three-dimensional. Thus, a flat DTP should be absent." Moreover, from the clinical point of view, urologists are more interested in the urethral sphincter than in the DTP. In this context, if the "flat" DTP is considered to be a continuation of the three-dimensional urethral sphincter forming a common structure, identification of the DTP appears to be difficult. Actually, using specimens from elderly males, Murakami et al. (2002) displayed the DTP near the inferiormost part of the external urethral sphincter at the level immedi-

ately inferior to the levator ani sling. Therefore, the question "does the DTP exist?" should be changed to "which structures correspond to the DTP in elderly specimens?" The strict intergender difference in the DTP, that was proposed by Fritsch et al. (2004; see above), should also be reexamined using elderly specimens. Consequently, the aims of this study were (1) to examine macroscopic features of the DTP, (2) to assess the topographical anatomy of the perineal muscles at histological level and (3) to relate the histological findings to the variations at macroscopic level concerning size and thickness.

Materials and methods

During students' dissection courses at Sapporo Medical University School of Medicine in 1999–2001, using 93 sides (right, 55; left, 38) of 59 male cadavers (56–92 years old, mean age 74.1 years), the first author (F.N.) examined whether the DTP was found. The students performed the following tasks: (1) dissection of the perineal branches of the posterior cutaneous nerve of the thigh; (2) identification of the pudendal nerve after division of the sacrotuberous ligament; (3) removal of fatty tissues in the ischioanal fossa and opening of Alcock's canal to observe the pudendal nerve and external pudendal artery from the proximal to the distal course. These duties were scheduled for 1-time practice (4 h) of a total of 32 times (four students for one cadaver). The students had already performed reflection of the gluteus maximus and dissection of the supra- and infra-piriforme foramina. The first author made two or three cut surfaces of the urogenital diaphragm and classified observations into scores 1–5 from unclear to definite morphology (see Results). The investigation was performed after students' dissections of the ischioanal fossa and urogenital diaphragm. These cadavers were donated to Sapporo Medical University for medical education and anatomy research with living registration. They had been fixed with arterial injection of 10L of 10% (v/v) formalin solution in water and stocked in 40% ethanol solution for more than 2 months until the dissection course started.

Besides those 59 male cadavers for dissection courses, we used another 17 donated cadavers for

Download English Version:

<https://daneshyari.com/en/article/8463020>

Download Persian Version:

<https://daneshyari.com/article/8463020>

[Daneshyari.com](https://daneshyari.com)