

The Comparison between Transanal and Transvaginal Ultrasonography of Anal Sphincter in Normal Women

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Purpose: The purpose of this study was to evaluate the normal value of the anal canal structures by transvaginal sonography in normal woman and compare this technique with the more commonly used transanal technique. **Methods:** Transvaginal ultrasonography was performed in 25 parous patients between 4th and 8th decade of age, using a Bruel and Kajer type-1890. This procedure was followed by transanal sonography using the same system. The thickness of mucosa and submucosa, internal and external anal sphincter and puborectalis muscle were measured by both methods. **Results:** The thickness of mucosa- submucosa, internal anal sphincter, external anal sphincter and puborectalis muscle by transvaginal sonography were 2.84 ± 0.2 (2.6 - 3.0) mm, 2.98 ± 0.4 (2.6 - 3.3) mm, 7.4 ± 0.3 (7.1 - 7.7) mm, 7.5 ± 0.5 (7.4 - 7.6) mm respectively (mean value \pm standard deviation and range). The detection rate of external anal sphincter and puborectalis muscle by transvaginal sonography were between 55.5% (5/9) and 71.4% (5/7). **Conclusions:** The thickness of internal anal sphincter was increased with age ($p < 0.05$). The thickness of mucosa-submucosa, internal anal sphincter measured. (JKSCP 2000;16:388 - 394)

Key Words: Transvaginal, Transanal, Sonography, Normal woman,

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(fistulography),

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(Fig. 1).

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SPSS (ver 7.0)

Student's t test . P < 0.05

Bruel and Kajer type-1890, Denmark 5, 7, 10 Mhz 1.5 cm

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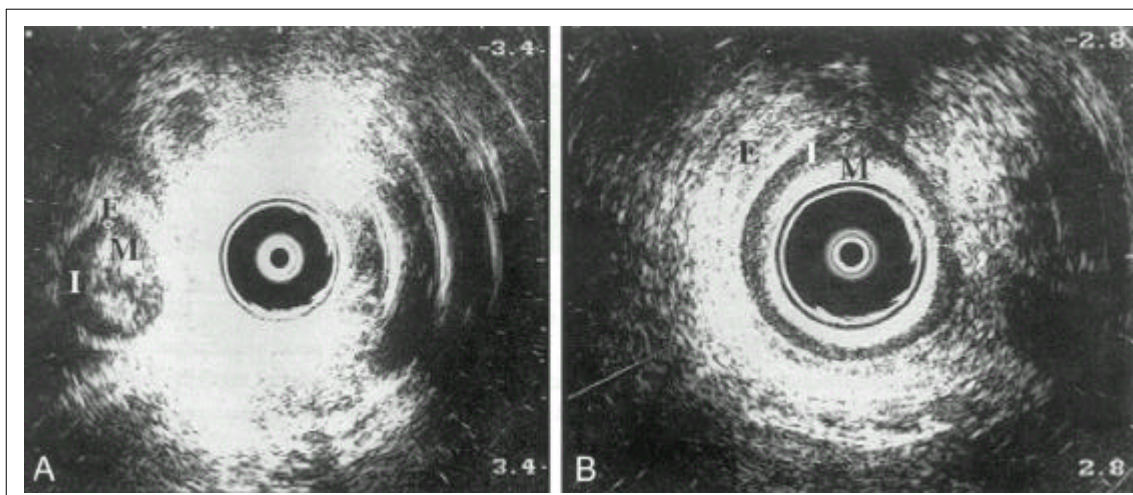


Fig. 1. Comparison of transvaginal and transanal sonographic findings in midanal canal. A. Transvaginal ultrasonography Mucosal cushions (M) are well seen at 3, 9, 11 o'clock direction with high density. Internal anal sphincter (I) and external anal sphincter (E) shaped like round band with lower density and mixed density respectively. Perineal areas near from vagina reveal good resolutions. B. Transanal ultrasonography. Mucosal cushions (M) are distorted and flattened. Internal anal sphincter (I) and external anal sphincter(E) shaped like round band with lower density and mixed density respectively. Perineal area near from vagina reveal poor resolutions.

(Fig. 1). 가 가 100% (n=38). 가 가 30, 40 7 5 (71.4%), 50, 60, 70 8 5 (62.5%) 가 가 30, 40, 50 2 8 5 (62.5%) 60, 70 9 5 (55.5%) (Table 1).

가 가 2.28 ± 0.4 mm (±), 30 : 2.0 ± 0.4 mm, 40 : 2.1 ± 0.6 mm, 50 : 2.4 ± 0.7 mm, 60 : 2.3 ± 0.5 mm, 70 : 2.6 ± 0.3 mm 가 가 2.84 ± 0.2 mm 30 : 2.6 ± 0.5 mm, 40 : 3.0 ± 0.4 mm, 50 : 3.0 ± 0.5 mm, 60 :

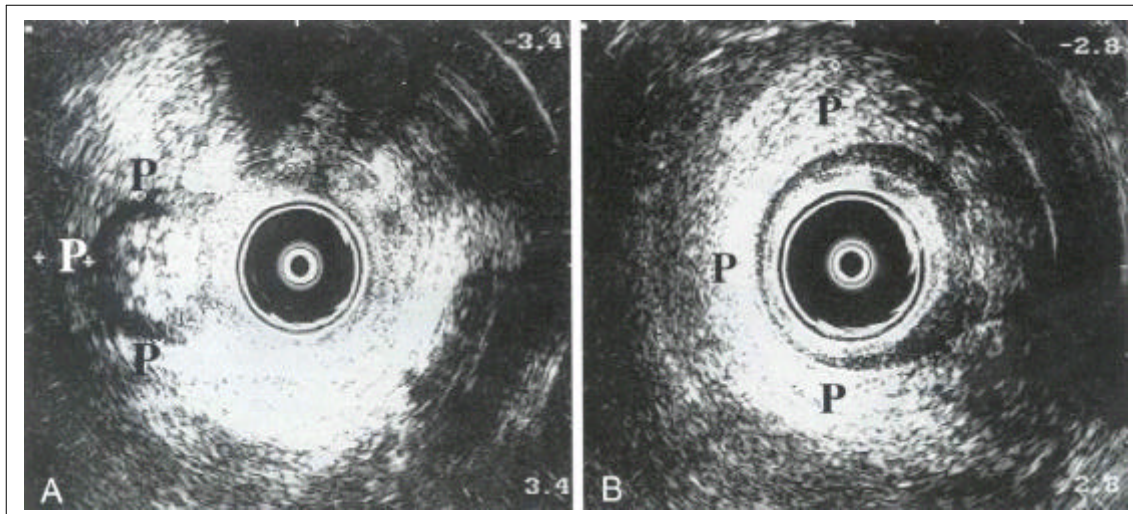


Fig. 2. Comparison of transvaginal and transanal sonographic findings in high anal canal. A. Transvaginal sonography U-shaped puborectalis muscle (P) is seen, Transvaginal ultrasonography revealed poor resolution at posterior part. Perineal areas near from vagina revealed good resolutions. B. Transanal sonography U-shaped puborectalis muscle (P) is seen, Transanal ultrasonography revealed good resolution at posterior part. Perineal areas near from vagina revealed poor resolutions.

Table 1. Detection rate of external anal sphincter and puborectalis muscle by using endovaginal ultrasonography

Age (Decade)	4 th	5 th	6 th	7 th	8 th
EAS	5/7 (71.4%)	5/7 (71.4%)	5/8 (62.5%)	5/8 (62.5%)	5/8 (62.5%)
PR	5/8 (62.5%)	5/8 (62.5%)	5/8 (62.5%)	5/9 (55.5%)	5/9 (55.5%)

EAS = External anal sphincter; PR = Puborectalis muscle; case number.

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 2.8±0.4 mm, 70 : 2.8±0.4 mm . (P<0.05, Table 3).
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 (P<0.05, Table 2).

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 7.12±
 2.48± 0.3 mm (±), 30 : 7.1±0.3 mm, 40
 0.3 mm (±), 30 : 2.2±0.4 mm, 40 : 7.2±0.5 mm, 50 : 7.2±0.6 mm, 60 : 7.0±0.5
 : 2.4±0.5 mm, 50 : 2.5±0.4 mm, 60 : 2.6±0.4 mm, 70 : 7.1±0.6 mm ,
 mm, 70 : 2.7±0.3 mm , 7.4±0.3 mm , 30 : 7.7±0.4
 2.98±0.4 mm , 30 : 2.6± mm, 40 : 7.6±0.3 mm, 50 : 7.2±0.6 mm, 60 : 7.2
 0.4 mm, 40 : 2.7±0.7 mm, 50 : 3.0±0.3 mm, 60 : ±0.4 mm, 70 : 7.3±0.3 mm . 50
 3.3±0.5 mm, 70 : 3.3±0.3 mm .
 (P<0.05, Table 4).

Table 2. Comparison of thickness of mucosa and submucosa (mean ±SD)

Age (Decade)	4 th	5 th	6 th	7 th	8 th
TAU	2.0±0.4	2.1±0.6	2.4±0.7	2.3±0.5	2.6±0.3
TVU	2.6±0.5	3.0±0.4	3.0±0.5	2.8±0.4	2.8±0.4

TAU = Transanal ultrasonography; TVU = Transvaginal ultrasonography; mm.

Table 3. Comparison of thickness of internal anal sphincter (mean ±SD)

Age (Decade)	4 th	5 th	6 th	7 th	8 th
TAU	2.2±0.4	2.4±0.4	2.5±0.4	2.6±0.4	2.7±0.3
TVU	2.6±0.4	2.7±0.7	3.0±0.3	3.3±0.5	3.3±0.3

TAU = Transanal ultrasonography; TVU = Transvaginal ultrasonography; mm.

Table 4. Thickness of external anal sphincter (mean ±SD)

Age (Decade)	4 th	5 th	6 th	7 th	8 th
TAU	7.1±0.3	7.2±0.5	7.2±0.6	7.0±0.5	7.1±0.6
TVU	7.7±0.4	7.6±0.3	7.2±0.6	7.2±0.4	7.3±0.3

TAU = Transanal ultrasonography; TVU = Transvaginal ultrasonography; mm.

Table 5. Thickness of puborectalis muscle (mean ±SD)

Age (Decade)	4 th	5 th	6 th	7 th	8 th
TAU	7.3±0.4	7.3±0.4	7.5±0.6	7.7±0.4	7.5±0.2
TVU	7.5±0.4	7.5±0.3	7.5±0.2	7.4±0.4	7.6±0.6

TAU = Transanal ultrasonography; TVU = Transvaginal ultrasonography; mm.

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7.46±
 0.6 mm (±), 30 : 7.3±0.4 mm, 40
 : 7.3±0.4 mm, 50 : 7.5±0.6 mm, 60 : 7.7±0.4
 mm, 70 : 7.5±0.2 mm ,
 7.5±0.5 mm , 30 : 7.5±0.4
 mm, 40 : 7.5±0.3 mm, 50 : 7.5±0.2 mm, 60 : 7.4
 ±0.4 mm, 70 : 7.6±0.6 mm . 50 , 60

(P < 0.05, Table 5).

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(P < 0.05)

Sandridge¹³

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(P < 0.05).

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(Fig. 2).

Sandridge¹⁴

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