Pelvic floor measurements associated with urinary incontinence. How is the concordance between urologists and radiologists?

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Introduction

There is an emerging interest in the preoperative assessment of MRI pelvic floor measurements as possible predictors of post-prostatectomy incontinence.

However, there is still **no evidence about the reliability of these measurements** or whether they are reliable when carried out by a urologist without previous experience in prostate MRI.

OUR OBJECTIVE was to assess the interobserver agreement between two experts in pelvic floor imaging (radiologists), and two observers with less experience (urologists) for different measurements of the pelvic floor in preoperative prostate MRI.

Methods and Materials

57 patients who had undergone prostate MRI prior to robotic radical prostatectomy were selected by consecutive sampling.

Measurements were made by each observer blindly.

The **interobserver agreement was determined**, using two methods:

- Intraclass correlation coefficient (ICC)
- Bland-Altman graphical method.

To determine the strength of the agreement with ICC, the proposal by Landis Koch was used:

- **Almost perfect:** ICC 0.81-1.00
- **Substantial:** ICC 0.61-0.80
- **Moderate:** ICC 0.41-0.60
- **Fair:** ICC 0.21- 0.40
- **Slight: ICC** 0.01-0.20
- **Poor: ICC=0**

Finally, the median of the agreement scores for each measurement and each combination of observers was calculated to obtain a summary measure.

Results: Table 1. Summary of interobserver agreement for pelvic floor measurements in preoperative MRI.

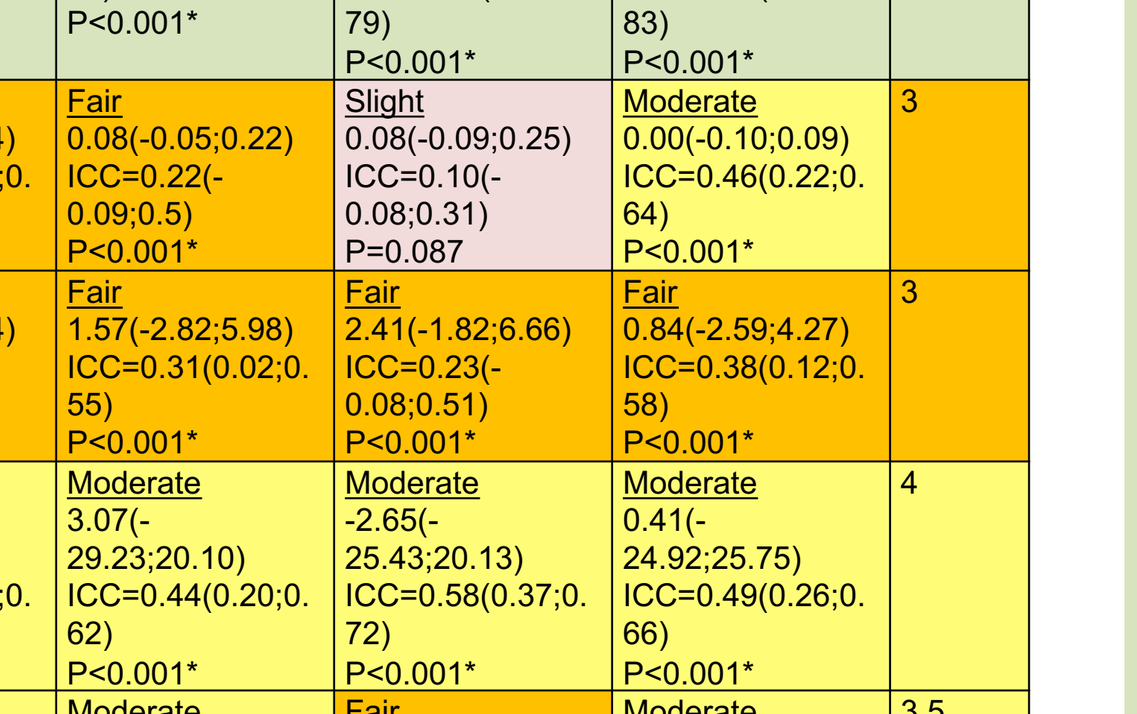
	Urologist 1-Urologist 2	Urologist 1-Radiologist 1	Urologist 1-Radiologist 2	Urologist 2-Radiologist 1	Urologist 2-Radiologist 2	Radiologist 1-Radiologist 2	M^
Membranous urethral lenght	Moderate -2.98 (-10.50;4.95) ICC= 0.43(0.06;0.66) P<0.001*	Moderate 0.58 (-7.93;6.78) ICC=0.57(0.60;0.72) P<0.001*	Moderate -1.54(-9.37;6.29) ICC=0.43(0.20;0.62) P<0.001*	Fair 2.40(-4.31;9.11) ICC=0.37(0.05;0.60) P<0.001*	Moderate 1.43(-4.79;7.56) ICC=0.44(0.19;0.63) P<0.001*	Moderate 0.97 (-6.87;4.94) ICC=0.51(0.29;0.68) P<0.001*	4
Intravesical prostatic protrusion	Substantial 0.43(-6.80;7.66) ICC=0.65(0.47;0.78) P<0.001*	Substantial 1.38(-4.27;7.03) ICC=0.72(0.51;0.84) P<0.001*	Moderate 2.33(-3.88;8.53) ICC=0.57(0.17;0.76) P<0.001*	Moderate 0.95(-5.43;7.33) ICC=0.57(0.17;0.76) P<0.001*	Substantial 1.89(3.83;7.61) ICC=0.66(0.33;0.82) P<0.001*	Substantial 0.94(-3.98;5.87) ICC=0.74(0.58;0.84) P<0.001*	5
Levator ani muscle	Fair 1.00(-3.66;1.62) ICC=0.32(0.01;0.56) P<0.001*	Fair 1.35(-1.35;3.81) ICC=0.21(-0.06;0.46) P=0.005*	Slight 1.65(-1.55;4.72) ICC=0.12(-0.10;0.34) P=0.053	Slight 2.35(-0.74;5.24) ICC=0.02(-0.06;0.09) P=0.475	Slight 2.65(-0.64;5.84) ICC=0.01(-0.10;0.10) P=0.408	Fair 0.30(-2.13;2.83) ICC=0.37(-1.13;0.57) P=0.002*	2.5
Puborectalis muscle	Slight -3.29(-7.28;0.70) ICC=0.14(-0.08;0.39) P=0.002*	Slight 1.96(-6.67;2.73) ICC=0.13(-0.07;0.34) P=0.071	Poor -0.01(-4.80;4.78) ICC=-0.01(-0.26;0.28) P=0.468	Fair 1.32(-2.63;5.27) ICC=0.29(0.02;0.52) P=0.002*	Poor 3.27(-1.32;7.87) ICC=-0.01(-0.01;0.09) p=0.587	Poor 1.92(-3.05;6.90) ICC=-0.6(-0.21;0.13) P=0.749	1.5
Obturator internus muscle	Fair 2.43(-2.83;7.69) ICC=0.35(-0.02;0.61) P<0.001*	Substantial 0.59(-2.76;3.93) ICC=0.76(0.62;0.86) P<0.001*	Moderate 0.47(-4.14;5.09) ICC=0.55(0.34;0.71) P<0.001*	Fair -1.85(-7.15;3.46) ICC=0.39(0.08;0.62) P<0.001*	Fair 1.98(-8.03;4.08) ICC=0.22(-0.03;0.44) P=0.018*	Moderate 0.10(-5.38;5.18) ICC=0.43(0.19;0.62) P<0.001*	3.5
Prostate volume	Substantial 7.21(-15.03;29.44) ICC=0.74(0.45;0.87) P<0.001*	Almost perfect 0.10(-15.59;15.80) ICC=0.91(0.86;0.95) P<0.001*	Substantial 1.93(-28.48;32.34) ICC=0.69(0.53;0.81) P<0.001*	Substantial -7.1(-25.65;11.44) ICC=0.80(0.46;0.91) P<0.001*	Substantial 5.28(-34.97;24.42) ICC=0.66(0.47;0.79) P<0.001*	Substantial 1.83(-26.99;30.65) ICC=0.73(0.59;0.83) P<0.001*	5
Ratio levator ani /prostate volume	Fair 0.05(-0.19;0.08) ICC=0.35(0.02;0.6) P<0.001*	Moderate 0.03(-0.05;0.11) ICC=0.55(0.14;0.76) P<0.001*	Fair 0.03(-0.08;0.14) ICC=0.40(0.13;0.6) P<0.001*	Fair 0.08(-0.05;0.22) ICC=0.22(-0.09;0.5) P<0.001*	Slight 0.08(-0.09;0.25) ICC=0.10(-0.08;0.31) P=0.087	Moderate 0.00(-0.10;0.09) ICC=0.46(0.22;0.64) P<0.001*	3
Urethral width	Moderate 0.26(-5.05;4.52) ICC=0.47(0.24;0.65) P<0.001*	Fair 1.31(-3.34;5.96) ICC=0.29(0.04;0.51) P=0.004*	Fair 2.15(-1.94;6.24) ICC=0.30(-0.06;0.57) P<0.001*	Fair 1.57(-2.82;5.98) ICC=0.31(0.02;0.55) P<0.001*	Fair 2.41(-1.82;6.66) ICC=0.23(-0.08;0.51) P<0.001*	Fair 0.84(-2.59;4.27) ICC=0.38(0.12;0.58) P<0.001*	3
Angle membranous urethra-prostate axis	Substantial 2.13(-16.55;20.82) ICC=0.70(0.54;0.81) P<0.001*	Fair 0.94(-27.79;25.92) ICC=0.39(0.14;0.59) P<0.001*	Moderate 0.52(-25.27;24.23) ICC=0.49(0.26;0.66) P<0.001*	Moderate 3.07(-29.23;20.10) ICC=0.44(0.20;0.62) P<0.001*	Moderate -2.65(-25.43;20.13) ICC=0.58(0.37;0.72) P<0.001*	Moderate 0.41(-24.92;25.75) ICC=0.49(0.26;0.66) P<0.001*	4
Prostatic urethral length	Fair 11.42(-8.10;30.93) ICC=0.23(-0.08;0.5) P<0.001*	Fair 8.59(-9.10;26.27) ICC=0.33(-0.04;0.6) P<0.001*	Moderate 5.59(-14.24;25.43) ICC=0.44(0.15;0.65) P<0.001*	Moderate -2.83(-14.19;8.53) ICC=0.57(0.31;0.73) P<0.001*	Fair 6.06(-22.02;9.91) ICC=0.38(0.04;0.63) P<0.001*	Moderate -2.82(-16.20;10.56) ICC=0.56(0.31;0.73) P<0.001*	3.5
M^	3.5	3.5	4	3	3	4	

Table 1. Value of each box: mean of the difference (95% confidence interval) and below ICC value (95% confidence interval; / m^= Median agreement score for each measurement and for each combination of observers, assuming that: Almost perfect=6, Substantial=5, Moderate=4, Fair=3; Slight=2, Poor=1.

Discussion

Most pelvic floor measurements have good or moderate interobserver agreement, except levator ani thickness and puborectalis muscle thickness. A standardized form of measurement of these muscles must be established.

The highest agreement was obtained for the two radiologists and for urologist-1 with the radiologist 1. This seems to suggest that it is not necessary to have an extraordinary specialization to correctly carry out MRI measurements.



Conclusions

Most pelvic floor measurements have good or moderate interobserver agreement, except for LAM thickness and puborectalis muscle thickness. For the latter, a standardized form of measurement must be established to improve their reliability.

It does not seem that an extraordinary specialization should be necessary to carry out the measurements correctly.