

**ANAL RETRO RESISTANCE PRESSURE (ARRP); A NOVEL TECHNIQUE TO TEST THE FUNCTION OF THE ANAL SPHINCTER .**Hypothesis / aims of study

At present there is no well established test to measure the function of the anal sphincter. Anorectal manometry is widely performed but there is no unanimity on how to perform it neither on its clinical relevance. Rectal ultrasound is recommended as a test to visualise the internal and external sphincter but only gives insight into anatomical details and is not a function test.

Recently the principle of the retrograde resistance pressure measurement in the urethra was brought, again, under our attention(1). The attractive principle of this test is the fact that it measures the functional capacity of a sphincter and not only a pressure somewhere along the wall of the sphincter . We decided to test this instrument for the anal sphincter.

Study design, materials and methods

Twenty patients from the outpatients of the departments of gynecology and colorectal surgery were included for this pilot study. Ten of them were faecally incontinent ( Parks classification 2 (n=4), Parks classification 3 (n=4) and Parks classification 4(n=2) and 10 were faecal continent(Parks classification 1) .All women gave informed consent to participation in the study. All measurements but four were performed in semi-lithotomy position. The ARRP was measured with The Monitorr device(Gynecare, Johnson & Johnson). A cone shaped device was introduced 5 mm in the external anal canal . The device infuses sterile water into the anus with a rate of 1ml/second. Simultaneously it measures the pressure in cm H<sub>2</sub>O required to open the anal sphincter. The curve has a steep ascending phase and then plateaus of and shows the pressure required to keep the flow of water in the open anal canal.(Figure) The test has a duration of 20 seconds. All women were tested three times; first two times in rest The last test was performed , after instruction, with the anus maximally squeezed. A typical test took 10-15 minutes including verbal explanation and changes of clothes.

Figure 1 shows a typical test in rest and during maximal squeezing. We measured, apart from the ARRP, the time in seconds to reach the ARPP, steepness of this opening curve and the decrease of the plateau curve in percents of the ARRP.

All women were asked after the examination about their experiences.

All data were entered in a SPSS 11.5 statistical programme.

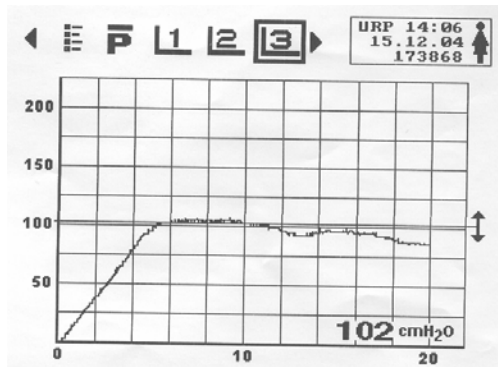


Figure 1 . A typical curve in ARRP with a steep ascending phase and a plateau phase which has a tendency of decreasing during the measurement.

Results

None of the women indicated any pain from the procedure and all but one found the test fully acceptable.

The median age in the study group was 64(38—86 years) and median parity was 2(0-4 children).

Table 1 gives the essential data in the continent and incontinent group. (Because of limited number of women included we decided not to perform a statistical analysis between groups in this material).

ARRP result	Continent		Incontinent	
	Mean	St dev	Mean	St dev
ARRP1	71	21	53	18
T1	4.3	2.0	3.6	1.8
Decrease 1	21	17	21	20
ARP2	67	22	51	16
T2	3.2	1.8	3.7	2.0
Decrease 2	15	5	15	8
ARP squeeze	94	28	47	14
T squeeze	5.3	3.0	3.0	1.1
Decrease squeeze	7	6	3	6

ARRP= Anal Retro Resistance Pressure.(cm H2O)

T= time to reach the plateau phase.(seconds)

The two measurements in rest were compared for test-retest correlation.

There was a significant and extremely high correlation between the ARRP of the two measurements of  $r=0.935$ . The time to reach the plateau phase showed a correlation of  $r=0.87$

#### Interpretation of results

The ARRP is a promising new device to test the anal sphincter function. It is extremely acceptable for patients, simple to perform and not time consuming. It is an attractive concept for measuring the total sphincteric function both in rest and during maximal squeezing. The first results are extremely promising. It has good test-retest correlation and there is a clear difference between continent and incontinent volunteers and also in the possibility to increase the ARRP during squeezing. This last phenomena might be a crucial way in preventing faecal incontinence during moments of intra-abdominal pressure increase. The squeeze test has also potential to develop to a true function test for the voluntary action of the pelvic floor muscles.

Further research to test the Monitorr for anal sphincter function examination are under way.

#### Concluding message

The ARRP measurement shows promise in the diagnosis and management of anal incontinence.

References.

1. Relationship of Urethral Retro-Resistance Pressure to Urodynamic Measurements and Incontinence Severity. *Neurourol Urodyn* 2004;23:109-14

**FUNDING: Gynecare, Johnson & Johnson**