

## Hydronephrosis and utero-vaginal prolapse in postmenopausal women: management and treatment

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**SUMMARY: Hydronephrosis and utero-vaginal prolapse in postmenopausal women: management and treatment.**

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*Introduction. Pelvic organ prolapse is a multifactorial disease. Aim was to evaluate the effect of the whole surgical correction of pelvic floor on hydronephrosis due to severe prolapse.*

*Patients and Methods. A retrospective case study on 250 patients presenting with severe uterovaginal prolapse was carried out.*

*Results. Hydronephrosis was found in 32/234 (13.7%). All patients*

*underwent hysterectomy, vaginal apex axial suspension, posterior and anterior repair, vaginally. Prepubic TICT (Tension free Incontinence Cystocele Treatment) was done in 38 cases (3 with hydronephrosis). Of the 32/234 (13.7%) patients with hydronephrosis, 18/32 (56.25%) had complete resolution of hydronephrosis after treatment, 14/32 (43.75%) had a reduction of calico-pyelic dilatation, among them 8 patients had a second degree and 6 a first degree of hydronephrosis.*

*Conclusions. Vaginal-hysterectomy, axial apex suspension, anterior and posterior repair resulted in either complete resolution or improvement of hydronephrosis. Prepubic TICT did not interfere on mechanical obstruction and maintained postoperative continence in the event of occult Stress Urinary Incontinence (SUI).*

KEY WORDS: Hydronephrosis - Prolapse - Uterus - Obstruction.

### Introduction

Pelvic organ prolapse (POP) is characterized by protruding organ from the vaginal opening. POP occurs when pelvic floor muscles and ligaments stretch and weaken, providing inadequate support for the uterus, bladder and rectum. It is a debilitating condition of unknown aetiology affecting > 50% of women over 40 years of age. Women diagnosed with POP often report anxiety, fear of rejection, fear of not being sexually desirable and shame. Shame is a negative and self-conscious emotion, described as the sentiment of being exposed, ridiculous and undervalued. The internalization of unworthy or abusing parents (1) may have an important impact in causing such emotion together with other dysfunctional attitudes (2, 3) and disadaptive disorders (4, 5). Based on the circumstances, the modified concept

“ill woman” does not inherit the properties of the head noun “woman” (6) and causes a sort of stigmatization of the sick person. As a result these patients experience a low quality of life (QoL). In POP patients, the vaginal walls are weakened allowing descent of pelvic organs (7, 8). Bladder, uterus and rectum first come down into vagina and after protrude out of hymen. The anatomic reason is a loss of pelvic support from multiple reasons, including direct injury to the levator ani, as well as neurologic damage from stretching of the pudendal nerves. Previous operative vaginal deliveries and hysterectomy for pelvic organ prolapse are main factors; an increase in intra-abdominal pressure from chronic coughing, straining with constipation, or repeated heavy lifting are the triggering causes (9, 10).

Hydronephrosis in the gynecological field is present in many diseases including high degree genital mechanical defects, endometriosis and post surgical iatrogenic lesions (11-13). Pathologic calico-pelvic dilation in patients with POP ranges between 7.7% and 17%. It has been showed prevalence of hydronephrosis significantly correlates with prolapse severity (14).

Renal involvement associated with pelvic organ prolapse tends to worsen progressively. Restoration of the pelvic floor may avoid kidney damage.

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Aim was to evaluate the effect of the whole surgical correction of pelvic floor defects (Vaginal-hysterectomy, axial apex suspension, anterior and posterior repair) on hydronephrosis due to severe prolapse.

structive renal calculi, adherences, endometriosis or post-operative damages were excluded from the study.

There were 9 preoperative dropouts and, after, 7 post-operative dropouts. All pelvic defects were solved during the same operation for a complete repair of pelvic floor (Table 1).

## Patients and Methods

A retrospective case study of 250 patients presenting with severe uterovaginal prolapse was carried out. All patients had fourth degree of one or more compartments. Preoperatively and postoperatively all patients underwent abdominal and vaginal US as well as blood tests and urine culture.

Baden-Walker Half Way System and POP quantification were used for the Evaluation of descensus (15) (Fig. 1).

Hydronephrosis following other causes such as urinary tract obstruction secondary to pelvic mass, ob-

TABLE 1 - DISTRIBUTION NUMBERS PLANE OF SAMPLE.

DISTRIBUTION PLANE	NUMBER OF SAMPLES
Initial elective patients	250
Overall patients lost before surgery	9
Overall patients operated	241
Post-operative drop-out	7
Effective follow-up patients	234

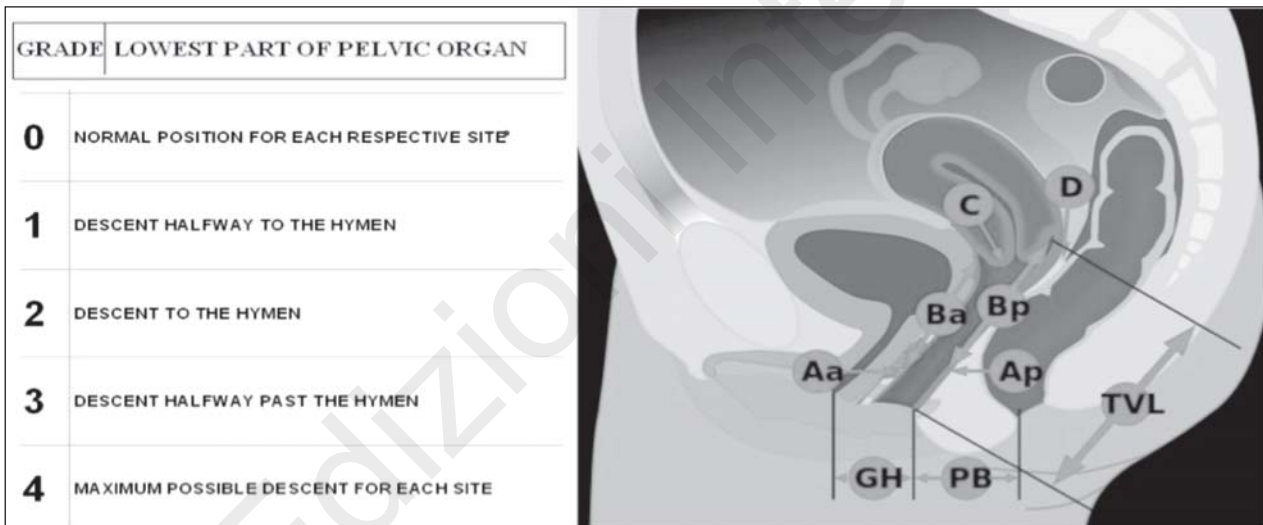


Fig. 1 - Baden-Walker system (on the right) and POP quantification (on the left) are the main measures for the evaluation of descensus.

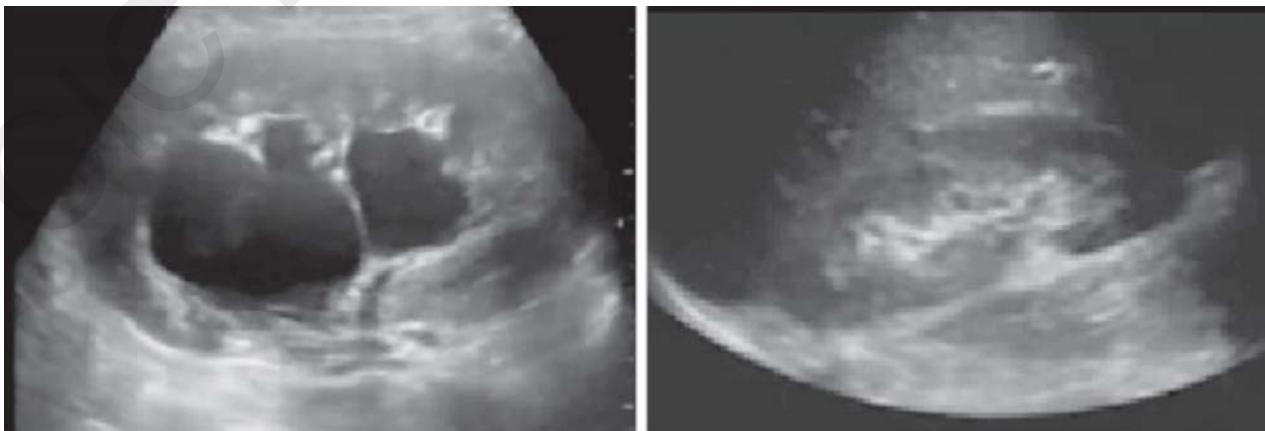
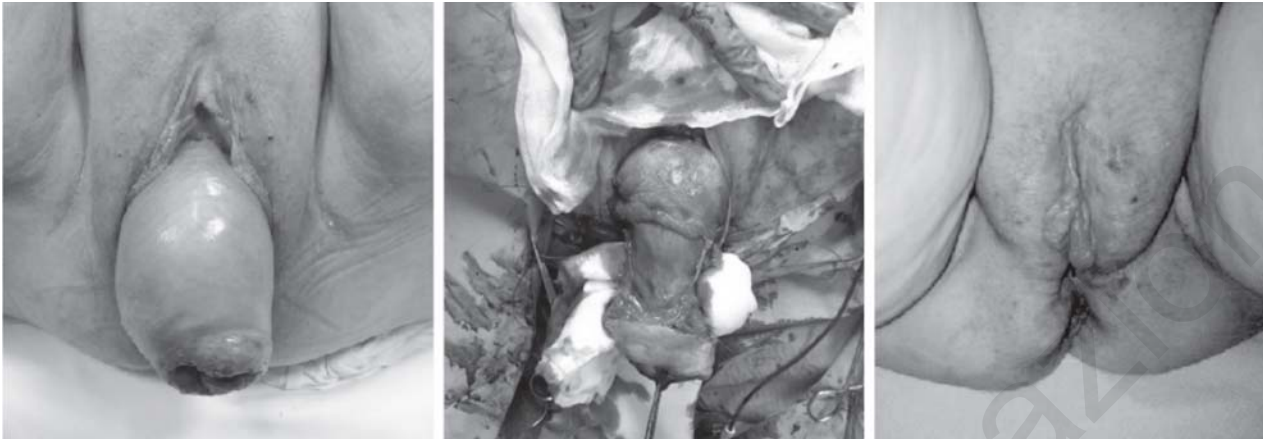


Fig. 2 - Hydronephrosis on the right and normal kidney on the left.



**Fig. 3 - POP procedure: before, during and after surgery.**

Before and after operation all patients underwent renal US and renal function blood tests. Pelvic floor defects were assessed using Baden-Walker Halfway System and POP Quantification. Renal US was performed during diagnostic phase, before surgery, three days after surgery, four weeks and six months after surgery. Hydronephrosis was defined solved as no residual hydronephrosis four weeks and six months after surgery was found. Renal impairment was assessed based on evaluations of serum urea and creatinine levels.

After opportune informed consent, all defects were treated by pelvic vaginal route. Surgery was the following. After either spinal or epidural anesthesia (16, 17), the patient was placed in the dorsal lithotomy position. A thorough bimanual examination was carried up before performing hysterectomy. Both vulva and vagina were fully prepped with a surgical soap solution. The cervix was exposed by placing a weighted posterior vaginal retractor into the vagina. A small right-angle retractor was used to elevate the anterior vaginal wall; a second right-angle retractor displaced one lateral vaginal wall and exposed the cervix. Two tooth clamps were used to grasp the anterior and posterior lips of the cervix and pull them outside vulvar meatus. Vaginal skin at its junction to the cervix was injected with a physiological solution for obtaining dissociation of tissues. Mucosa was incised with a scalpel around the entire cervix. The incision was done on pubovesical cervical fascia anteriorly and on perirectal fascia posteriorly. While traction was applied on the anterior tenacula, dissection of bladder was applied. With either scissors or sponge-covered finger bladder was dissected all the way up to the peritoneal vesico-uterine fold. A right-angle retractor was placed under the vaginal mucosa and bladder. It was used to elevate the bladder. This maneuver helped in identifying the peritoneal vesico-uterine fold. Strong downward traction was applied to the tenacula on the cervix, and the peritoneal

vesico-uterine fold was grasped with pickup forceps and incised. By elevating peritoneal vesico-uterine fold with forceps, anterior aspect of uterus was seen. A finger in this hole and exploration of the area was done to be sure of entering into the peritoneal cavity and not into the bladder. The tenacula were brought acutely up toward the pubic symphysis, exposing the cul-de-sac. Pickup forceps were used to retract the posterior vaginal cuff, thereby placing the peritoneum of the cul-de-sac on tension. The peritoneum of the cul-de-sac was incised with curved Mayo scissors, avoiding rectal lesions. A forefinger was immediately placed in the cul-de-sac, and the area was explored. A second right-angle Heaney retractor was placed into the posterior cul-de-sac to open Douglas space. By means of two Heaney retractors the broad ligament was exposed from the utero-sacral ligament to the tubo-ovarian round ligament. Placing a finger in the posterior cul-de-sac and moving it laterally revealed the whole uterosacral ligament as it attaches to the posterior aspect of uterus. A synthetic absorbable suture was used to ligate the uterosacral and, after, cardinal ligaments, separately. After first ligation, the ligaments were transfixed again so that the initial and final thread protruded in opposite sides, leaving the needle in the site. This mechanism allowed after the suspension of the vagina, the distal revascularization of the pedicle. Clamping, section and ligation of round ligament and infundibulopelvic were carried out. A suture had been placed from the inside of uterosacral, cardinal and round ligament at the tip of the vaginal mucosa, with the same needle. This procedure obtained hemostasis and physiological suspension of vaginal apex. The reperitonealization of the pelvis, carried out with pursestring sutures, provided a further suspension of the vaginal cuff. The suture was started on the anterior peritoneal edge and brought through all ligaments. The pursestring was continued down through one or more of the pedicles and finally brought th-

rough the vaginal mucosa, applying pedicles to give additional support of the upper vagina. The suture was continued posteriorly across the peritoneum of the cul-de-sac with one or more stitches. Anterior repair was done as follows: an incision was made along the center of the front wall of the vagina starting near the vaginal entrance and finishing near the top of the vagina. The vaginal skin was then separated from the underlying supportive Halban fascial layer. The weakened fascia was then repaired using late absorbable stitches. Excessive vaginal skin was removed and the anterior vagina was closed with absorbable sutures. Posterior repair was done as follows (18, 19): a horizontal incision was made where the back wall of the vagina meets the skin just outside the vagina. A vertical cut was then made in the back wall of the vagina, over the area of the bulge. The vaginal skin was then separated from the Denonvilliers rectal layer. Two or three stitches were placed in tissue at either side of the rectum. These stitches were then tied in the centre thus bringing the tissue into the middle so that the rectum is held behind them and well supported. This then stopped the rectum bulging into the back vaginal wall. Perineal suture completed posterior procedure. Prepubic TICT surgery was the following: the tissues were exposed through the vaginal opening, with stitches that spread the labia majora laterally. A mid-longitudinal incision was performed in correspondence with the vaginal wall, from the mid-urethra to the cervix. Two small dot-like incisions were made in the prepubic area around 2 cm laterally of the anterior commissure. Periurethral access was achieved laterally and parallel to the mid-urethra, with a thin Stamey's needle. A macroporous polypropylene long winged fly-shaped mesh was prepared. The wings had to be long enough to reach the prepubic area while the size of the body depended on the extent of the cystocele. No folds should have been left in the mesh since they may cause erosion. A thin Stamey needle was introduced in the suprapubic incision and, passing along the bone, reached the mid-urethra. The tissues crossed by the mesh were the bulbocavernous muscle, the ischiocavernous muscle, the mid-perineal fascia (diaphragm urogenital fascia), the anterior pubourethral ligament, the subcutis and the skin. The end of the mesh wings were anchored to the eyelet and taken from the vaginal area to the suprapubic area, starting from the mid-urethra. The procedure was performed bilaterally. One of stitches was placed at each end of the wings and one in correspondence with the anterior-mid part of the mesh (site of continence). The use of indicator threads was advisable for adjustment when there were doubts regarding the correction positioning of the mesh, particularly in severe forms of incontinence. The mesh was adjusted according to the stress test. Finally the excess part of the mesh wings was cut and the ends were embedded into the subcutaneous tissue. The bladder catheter was ge-

nerally removed within 48 hours and, if the patient urinated regularly, the residue was less than 50 cc and incontinence did not persist, the indicator threads were removed (20-22). Before the operation urine culture, micturition diary, 1hr pad test (ICS), prolapse staging according to POP-Q system, Q-Tip test, Bonney test, stress test at 200/400 ml with everted and reduced prolapse, VAS, complete urodynamic examination and informed consent were done. Comparisons of group means were performed with "t student" test for independent samples. Proportions were compared with chi-square test ( $\chi^2$ ). A logistic regression analysis was performed to control for covariates that differed in our two groups despite randomization. Pelvic Floor Impact Questionnaire (PFIQ - 7), King's Health Questionnaire (23) and locus of control of behavior (LCB) were used to evaluate Life Quality (24-26). Female Sexual Function Index (FSFI) was evaluated for sexuality determination (23).

## Results

The mean age was 64.8 years.

According to the Baden-Walker Halfway System, 220/234 (94 %) of the patients had concurrent grade 4 cystocele, 190/234 (81.2 %) hysterocele and 101/234 (43.2%) rectocele (Table 2).

Hydronephrosis was found in 32/234 (13.7%). All patients underwent hysterectomy, vaginal apex axial suspension, posterior and anterior repair vaginally. Prepubic TICT was done in 38 cases (3 with hydronephrosis). All cases treated with TICT were continent following surgery. There were no cases of bladder perforation, vaginal haematoma, abscess formation, post-operative haemorrhage or bleeding requiring laparotomy. Post operative complications included 6/234 (2.6%) cases of voiding difficulties, 3/234 (1.28%) cases of de novo instability. The four cases of voiding difficulties were solved spontaneously within ten days. Pollakisuria and mictu-

TABLE 2 - POP-Q AND PFIQ-7 RESULTS.

Points	Pre-operative	Post-operative	p
Aa	2.2 ±1.0	-2.8±0.3	<0.05
Ba	5.1±2.3	-2.9±0.4	<0.05
Ap	2.0±2.1	-2.9±0.3	<0.05
Bp	2.1±3.1	-2.9±0.1	<0.05
C	4.1±3.2	-7.4±0.9	<0.05
D	-1.5± 2		
TVL	9	8	
Pelvic Floor Impact Questionnaire (PFIQ - 7)	80.8± 39.5	10± 15.6	<0.05

rition urgency were found in 9 (3.8%) cases while urge incontinence in 6 (2.6%) cases. Of the 32/234 (13.7%) patients with hydronephrosis, 18/32 (56.25%) had complete resolution of hydronephrosis after treatment, 14/32 (43.75%) had a reduction of calico-pyelic dilatation, among them 8 patients had a second degree and 6 a first degree of hydronephrosis.

The patients who persisted third grade calicopyelic dilation reported to suffer from prolapse for more than 10 years.

Incidence of renal impairment was 3.3%: serum urea ranged from 10.4 to 17.8 and creatinine from 141 to 215  $\mu\text{mol/L}$ . Postoperative serum creatinine levels improved in all patients with renal impairment.

During follow-up two pelvic procedure were requested. Post-operative Q-tip test average was 26 degrees (range 15-49). PFIQ-7 showed a reduction of score from  $80.8 \pm 39.5$  to  $10 \pm 15.6$  and, in addition, we found significant difference in VAS scores and in the majority of the main domains in King's Health Questionnaire and LCB regarding pre-operative and post-operative data ( $p < 0.001$ ). Subject full satisfaction was: 91%. The mean values of FSFI scores before, and 6 months after the operation were  $23.13 \pm 8.21$  vs.  $34.01 \pm 9.13$  ( $p < 0.001$ ) respectively.

## Discussion

Renal involvement linked to pelvic organ prolapse ranges from acute to chronic renal failure and may also lead to end stage renal failure. Prolonged duration and its severity in pelvic organ prolapse are responsible for renal impairment. Dongol et al. (2013) reported among 140 cases of pelvic prolapse, a total 3.57% patients with hydronephrosis. Total 49 (34.1%) patients had moderate to severe renal failure. Forty six (32%) in stage III moderate reduction in creatinine clearance, 2 (1.4%) with severe reduction and 1(0.7%) in end stage renal failure.

Literature data show untreated hydronephrosis may progress to severe renal damage (27). This suggests that

the resolution of hydronephrosis results in either recovery or improvement of renal function. Our work indicates that suitable treatment of prolapse has a very important role for anatomic and functional damage of pelvic floor and urinary apparatus. Renal and urinary tract US and renal functional blood tests on patients with severe prolapse must be performed before and after surgery. Finally, in our report incidence of hydronephrosis in patients with severe uterovaginal was 13.7% and renal impairment 3.3%: the risk of worsening should prompt a search for adequate remedy and in the majority of patients, our treatment for severe uterovaginal prolapse by vaginal route resulted valid although other surgical technique can be carried out. Besides, both hydronephrosis and renal impairment have a correlation with duration and severity of pelvic floor defects.

When calico-pyelic dilations are inveterated (>10 years) complete post-surgical recovery is less probable. Bonney test is highly positive and confirmed by urodynamics after manual prolapse reduction, prepubic TICT is a proper technique to avoid post operative stress urinary incontinence. The review of the literature considers the prepubic procedure having no risk of urinary obstruction in comparison with other tension-free mini-invasive techniques (28). Accordingly we may claim reduction of calico-pyelic dilation following severe descensus can have either a temporary or a definitive resolution; the former is obtained by bed resting after manual reduction of prolapse and pessary apposition; the latter by means of correct and 360° opportune surgery.

## Conclusions

Vaginal-hysterectomy, axial vaginal apex suspension and anterior and posterior repair result in either complete resolution or improvement of hydronephrosis. Prepubic TICT does not interfere on mechanical obstruction and maintain postoperative continence in the events of occult SUI, thus resulting in a better quality of life for patients (29-34).

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