

## THE STUDY OF URINARY FUNCTION IN PROCIDENTIA IN AGED PATIENTS

by

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The impact of procidentia on the urinary system is known for past hundred years. Virchow, in 1846 described hydronephrosis and hydro-ureters in cases of genital prolapse. Halban and Tendler, in 1923, proved beyond a shadow of doubt when they described changes of hydrouretero-nephrosis in 15 cases in the autopsy studies of 23 cases of genital prolapse. Till recently the changes of hydrouretero-nephrosis were detected in cases of procidentia only after death. The detection of the back pressure changes in cases of prolapse during life is of recent origin. The credit of detecting the back pressure changes during life goes to Bretton and Rubin who, in 1923, performed intra-venous pyelographic studies on 10 cases of genital prolapse and detected hydronephrotic changes in 8 cases. Mirabeau, Hirokava, Sellheim, Young, Frank and Recker are some of the workers who have studied urinary changes in cases of genital prolapse. Chunilal Muckerjee and Ghosh from India have also studied urinary changes in genital prolapse. Very few workers have studied the urinary tract in cases of procidentia

in the aged patients. It is our purpose to study the urinary tract completely in the aged patients with procidentia.

### *Material and Methods*

This is a study of the urinary tract in cases of procidentia above the age of 45 years admitted in K.E.M. Hospital, Bombay, between 1957-1959 (three years). The following investigations are made. Urine routine examination, urine culture, residual urine, total urine output, blood urea nitrogen, plain X-ray abdomen and intravenous pyelographic studies. We very much wished to carry out the following further investigations, cystoscopy, cystograms and micturating cystourethrograms. Lack of X-ray plates prevented us from carrying out these.

### *Analysis*

Table I shows that routine urine examination was carried out on all the 80 cases. Evidence of urinary tract infection was found in 19 cases. The specific gravity of the urine varied between 1012-1018. The 24 hour urine output was studied a few days before the operation. The average urine output was 35-40 ounces. The lowest value of urinary output was 22

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TABLE I  
*Urine Routine*

No. of cases	Normal	Evidence of infection
80	61	19
Specific gravity .. .. .	—	Range 1012-1018
Urine output in 24 hours (average) .. .. .	—	35-40 ounces 22 oz. minimum 64 oz. maximum

ounces and highest value was 64 of the internal urinary meatus, one would come to the logical conclusion

Table II shows the results of urine culture. It was done on 40 cases. urine because the exit valve is at a

TABLE II  
*Urine Culture*

Cases studied	No. growth	Contaminants grown	B. Coli	B. Proteus
40	30	4	4	2

No growth of organisms was detected in 30 cases, whereas contaminants were grown in 4 cases. Four cases showed growth of B. Coli and 2 cases showed growth of B. Proteus. The infection was treated before performing the operation.

Table III shows that residual urine was charted in 60 cases. Special pre-

higher level. Our studies do not substantiate this mechanical concept. Urinary bladder is not an inert container, say like a cylinder with an exit valve somewhere in the middle, so that when the exit valve is opened, water below the level of the valve remains as a residue. Unlike a cylinder, bladder is a dynamic organ with its

TABLE III  
*Residual Urine*

Cases studied	Less than 2 ounces	More than 2 ounces
60	53	7

cautions were taken to see that the patients do not reposit the procidentia at the time of voiding. Residual urine was less than 2 ounces in 53 cases whereas only 7 cases showed residual urine more than 2 ounces. After studying the anatomical changes that take place in procidentia, namely the descent of the bladder and formation of a pouch below the level

tone and contractile power. So when the bladder descends below the level of the internal meatus, there should not be much of residual urine so long as the tone and contractile power of the bladder is good. The bladder musculature compensates by contracting a little more, so that during contraction, the pouch below the level of internal meatus disappears.

The mechanical concept of the residual urine stands correct only in longstanding cases of proidentia, where the bladder tone is diminished and contractile power poor. Residual urine was not an important feature in most of our cases because our patients may have retained good tone and contractile power of the urinary bladder. Residual urine may be found when the patient has come sufficiently late when the bladder musculature has lost its tone and contractile power.

Table IV shows that blood urea nitrogen studies were carried out on

ney function. This is because in a normal case there is good renal reserve to compensate for the loss of kidney tissue. In fact, when blood urea nitrogen values are raised it is a late sign and it means that considerable amount of kidney tissue is put out of function. The only information that the blood urea nitrogen studies give is that if the values are within normal limits, the kidney is able to compensate, though the back pressure changes may have taken place.

Table V shows the results of plain X-ray abdomen and intravenous pye-

TABLE IV  
Blood Urea Nitrogen Studies

Cases studied	Values within normal limits	Values raised above normal
54	48	6

The highest value of blood urea nitrogen was 56 mgm. per cent.

TABLE V  
X-Ray Studies

		No. of cases	Normal	Bladder stones	Ureteral stone	Changes of hydro-uretero-nephrosis
Plain x-ray	.. ..	42	39	2	1	—
I.V.P. studies	.. ..	14	8	2	1	6

54 cases. They were within normal limits in 48 cases. Only six cases showed some rise. The highest value was 56 mgm. per cent. Blood urea nitrogen studies have their limitations. These values may not rise till considerable amount of kidney tissue is affected by back pressure; kidney function and kidney disease are not synonymous. Kidney damage as a result of back pressure may exist in presence of normal kid-

lographic studies. Plain X-ray of the urinary tract was normal in 39 cases and only 3 cases showed presence of calculi—vesical calculi in two cases and ureteral calculus in one case. Out of 14 patients who were subjected to intravenous pyelographic studies, 6 cases showed changes of hydroureteronephrosis. The changes of dilatation and kinking of the ureters and hydro-nephrosis are well seen in these

cases. We have been able to notice one more change and that is ptosis of the kidney. We agree that even in normal cases the kidneys do descend a little when a patient is shifted from lying-down to standing posture. In our cases we believe that the descent is more than normal. We do not venture to make any generalization from a finding on an isolated case. But we do believe that ptosis of the kidney may develop as a result of prolonged dragging force by the ureters. Recker found back pressure changes in the kidney in 30 per cent of his cases of genital prolapse. The presence of bladder stones in genital prolapse is an interesting finding. We had the opportunity to report these two cases of bladder stones in genital prolapse. (1959)

The intravenous pyelographic studies were repeated in these cases, 3 to 6 months after Mayo Ward repair, to find out whether the changes of hydrouretero-nephrosis are reversible. Except for slight improvement in the kinking of the ureters no other noteworthy improvement was detected.

#### *Discussion*

In long-standing cases of procidentia, the urinary tract suffers anatomical changes because of the proximity of the latter with the genital tract. Anatomical changes in the urinary tract can bring about derangement of function.

So far as the urinary tract is concerned, following points require consideration in the management of procidentia in the aged.

(1) Whether the urinary changes endanger life or contraindicate surgery.

(2) Whether all the elaborate investigations of the urinary tract should be carried out before operation.

It is seen from our studies that urinary tract does suffer some anatomical changes in cases of long-standing procidentia though the degree of change varies with the duration of procidentia. In spite of these anatomical changes, the urinary function is the last to suffer. Majority of our cases show normal kidney function. As the study shows that kidney function in the majority of our cases is not altered and also considering the number of cases of procidentia we operate every year, all the elaborate investigations will be costly and time-consuming. In K.E.M. Hospital we do not subject all our cases to intravenous pyelographic studies unless there are symptoms of urinary obstruction. The studies of other workers as well as the present study have convinced us that though urinary obstructive changes may be present in some cases, they are no bar to surgical interference. We know that an occasional case of procidentia has died of ureaemia due to urinary obstruction (Frank), but such cases are exceedingly rare.

The presence of bladder stones in cases of procidentia require special management. There is general agreement that bladder stones must be tackled first and procidentia should be repaired later. There are two approaches to the removal of bladder stones. One approach is abdominal suprapubic cystolithotomy and another is vaginal cystolithotomy. Abdominal approach is preferred. The detailed management has been reviewed by the author (1959).

We believe that there is no need to subject all cases of procidentia to a very detailed study of urinary function save for academic reasons. Nevertheless we are convinced that simple investigations, like routine urine examination, bladder sounding and blood urea nitrogen studies, should be carried out as a routine in all cases of procidentia. The X-ray studies should be done as the need arises. Novak wrote in his editorial comments in *Obstetrical and Gynaecological Survey* that he did not subject all his procidentia cases to X-ray investigations. Some cases do require such studies and when indicated they must not be withheld. In longstanding cases of procidentia plain X-ray of urinary tract may reveal the presence of stones, in some cases.

#### *Summary and Conclusions*

(1) This is a study of the urinary function in cases of procidentia in aged patients.

(2) The study reveals that anatomical changes do take place in some cases of procidentia, but the kidney function does not suffer till late. Evidence of urinary tract infection was found in 25% of the cases.

(3) Hydrouretero-nephrosis was detected in 6 cases and two cases showed bladder stones and one case had ureteral stone.

(4) All cases of procidentia need not be subjected to detailed X-ray studies but investigations like routine urine examination, sounding of the

bladder and blood urea nitrogen studies should be carried out in all cases of procidentia.

(5) Residual urine is not an important feature in cases of procidentia.

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