Bladder Augmentation with Demubularized Intestinal Segment

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The authors report on 9 cases of bladder augmentation with detubularized intestinal segments. The capacity of the contracted bladder was increased in 4 cases; care was taken to prevent the development of an hour-glass bladder. In a young female patient a caecal-ileal segment was applied so that in case of a possible future pregnancy the mesentery should not hinder the growth of the uterus. In 4 cases hypertonic neurogenic bladders were augmented with intestinal segments, thus the further destruction of the kidneys could be avoided. In one case the reflux was hindered by a Kock valve, but stagnation developed above the valve, therefore it was eliminated and replaced by a 15 cm intestinal segment. In one case the uninhibited neurogenic bladder was augmented, the resistance of the urethra increased as a result of which the patient stayed dry between self-catheterizations. Attention is called upon the metabolic disturbances and increased risk of infection following intestinal implantations.

Introduction

The indication for and the surgical technique of bladder augmentation have been changed in the last 20 years. In the 60s and 70s augmentation became necessary most often in contracted bladders of tuberculotic origin [3]. Following the repression of tuberculosis, this entity disappeared from the clinical practice in Hungary. At present interstitial cystitis and neurogenic bladder require augmentation most frequently, though a great number of pathological processes may lead to a reduced capacity of the bladder. Detubularization of the intestinal segment used for augmentation may eliminate the pathological effects of peristalsis [2, 5].

Distinction should be made between bladder augmentation and replacement [6]. Replacement is performed following radical cystectomy, while augmentation is carried out after subtotal cystectomy.

Patients and methods

Bladder augmentation with detubularized intestinal segments was performed in 9 patients (4 females and 5 males). In two cases surgical indication was contracted bladder as a consequence of histologically proven interstitial
cystitis, with a capacity of less than 50 ml. In two further cases the development of contracted bladder was preceded by urological operations. In one of them both kidneys had been operated for calculous pyonephros, and postoperatively a contracted bladder developed, probably due to infection caused by frequent vesical endoscopies and ureteric catheterizations. The right kidney of the other, young female patient had been removed in childhood; several years later the ureteral stump was removed because of pyuria. Following surgery urinary seepage, then a fistula developed in the right corner of the surgical line. The fistula could not be closed even by five further operations. Presumably a small part of the bladder wall has been used up during each operation, the long-lasting indwelling catheterization has led to infections, and these resulted in contracted bladder, reflux in the left solitary kidney and a persistent fistula.

A separate group is formed of patients with neurogenic bladder caused by spina bifida. In their case low compliance and small effective capacity, which cannot be cured either by medication or regular self-catheterization, lead eventually to reflux, hydroureter and hydronephrosis. Our four patients had been operated on several times for reflux and hydronephrosis, while the proper cause of the disease, the neurogenic bladder, remained undetected. The terminal of the superfluous operations was percutaneous or open surgical nephrostomy. In our last patient, a girl with myelomeningocele, the indication for augmentation was incontinence due to uninhibited neurogenic bladder.

Prior to surgery ultrasonography, intravenous urography and urodynamic examination were carried out which proved the small effective capacity. In cases of neurogenic bladder augmentation was made only if incontinence, or reflux with consecutive dilatation of the upper urinary tract was encountered, and the creatinine level was below 300 μmol/l.

Surgical technique

After standard preoperative preparations, following lower median laparotomy the intestines were pushed into the upper part of the abdominal cavity. The contracted bladder was halved in its frontal plane. In cases of histologically proven interstitial cystitis the largest possible part of the bladder was removed, since the inflammation is retained in the residual bladder wall, and, by pressing the receptors, causes disturbingly frequent urgencies for urination. The neurogenic bladders also were halved in the frontal plane and resembled thus open shells. We attempted to make the anterior cockleshell smaller than the posterior one. With halving we made way for the intestinal cap and cut the nerves running in the bladder wall, thus the unnecessary contractions were eliminated at two points of attack. The halving incisure ran across the sphere, its terminal points reached the trigonum on both sides; thus a wide opening was made to prevent the development of an hour-glass bladder [4].

Segments of both the small and large intestines may be used for augmentation. We prefer the small intestine because of its excellent surgical-technical