

## **HETEROTOPIC TRANSVERSE COLON RESERVOIR: EXPERIMENTAL STUDY IN DOGS**

### **Hypothesis / aims of study**

The aim of this study was to compare two different techniques of heterotopic urinary diversion with continent mechanisms in colonic reservoirs in dogs, named the Monti's procedure associated to the Abol-Eneim's technique (Technique I) compared to the intussusception's technique (Technique II).

### **Study design, materials and methods**

Sixteen dogs of both sexes, weighting between 20 and 25 Kg were included in this study. All animals had perfect health status. Six dogs were used as a pilot group for the standardization of both techniques. In the experiment, ten dogs were separated into two groups of five.

The dogs received no food or fluid intake in the 12 hours preoperatively. They received endovenous general anesthesia and antibiotic coverage with metronidazole (50mg/Kg). After a median laparotomy, the colon was prepared intraoperatively with saline 0.9%

Both techniques isolate 20cm of transverse colon, preserving blood supply, to create the reservoir. In Technique I the distal 2,5cm of the colon segment is used to the conduit construction with the Monti technique [1]. The remainder 17.5cm of transverse colon is detubularized for reservoir construction. Continence mechanism is achieved by creating a serous lined extramural tunnel [2]. The other technique uses the same length of colon segment, but the reservoir construction is made with 14cm of detubularized colon and the remainder 6cm are used for the intussusception mechanism. Surgical time for each technique was compared, and the surgical procedures were evaluated by means of urodynamic study carried out 30 days after surgery. The urodynamic parameters analyzed were the reservoir capacity, the maximum pressure of the reservoir, and the compliance. After urodynamic evaluation, the dogs received anesthesia for the macroscopic and histological assessment of the reservoirs.

### **Results**

Median total surgical time was 260 minutes with Technique I and 210 minutes with technique II.

Urodynamic data showed no difference in reservoir compliance between the groups. However, reservoir capacity and maximum pressure of the reservoir were significantly higher in group I, as demonstrated by the Mann-Whitney test ( $p=0.03$  and  $0.04$ , respectively).

The conduits created were significantly longer in Technique I ( $p=0.04$ ).

Histological findings on the reservoirs and conduits in Technique II presented features similar to the normal colon tissue. Inversion in the direction of the muscular layer fibers was observed in the conduits in Technique I.

### **Interpretation of results**

Both procedures are complexes, but Technique I requires more surgical time.

Urodynamic evaluations revealed greater reservoir capacity with Technique I, which may be related to the length of colon used to create the reservoir. Also, maximum pressures of the reservoir were significantly higher in group I. This finding suggests a better continence mechanism, once compliance is not different between the groups.

The better continence achieved with Technique I may be related to the greater length of the conduits, to the histological alterations observed in the conduits of this group and also may reflect a more effective continence mechanism provided by serous lined extramural tunnel.

### **Concluding message**

Challenging surgical procedures may be necessary to treat the urinary complications of pelvic radiation therapy. The Technique described (Technique I) creates a longer conduit and provides a better continence mechanism.

## **References**

1. New techniques for construction of efferent conduits based on the Mitrofanoff principle. *Urology*, 49:112-5, 1997.
2. A novel uretero ileal reimplantation technique: the serous lined extramural tunnel: a preliminary report. *J Urol*, 151:1193-7, 1994.