URETERO - CUTANEOUS IMPLANTATION

Essay

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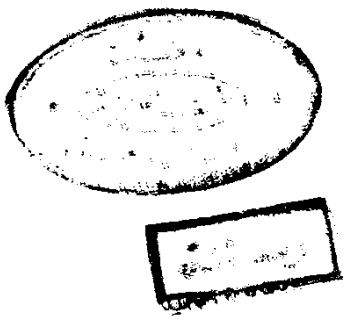
UROLOGY



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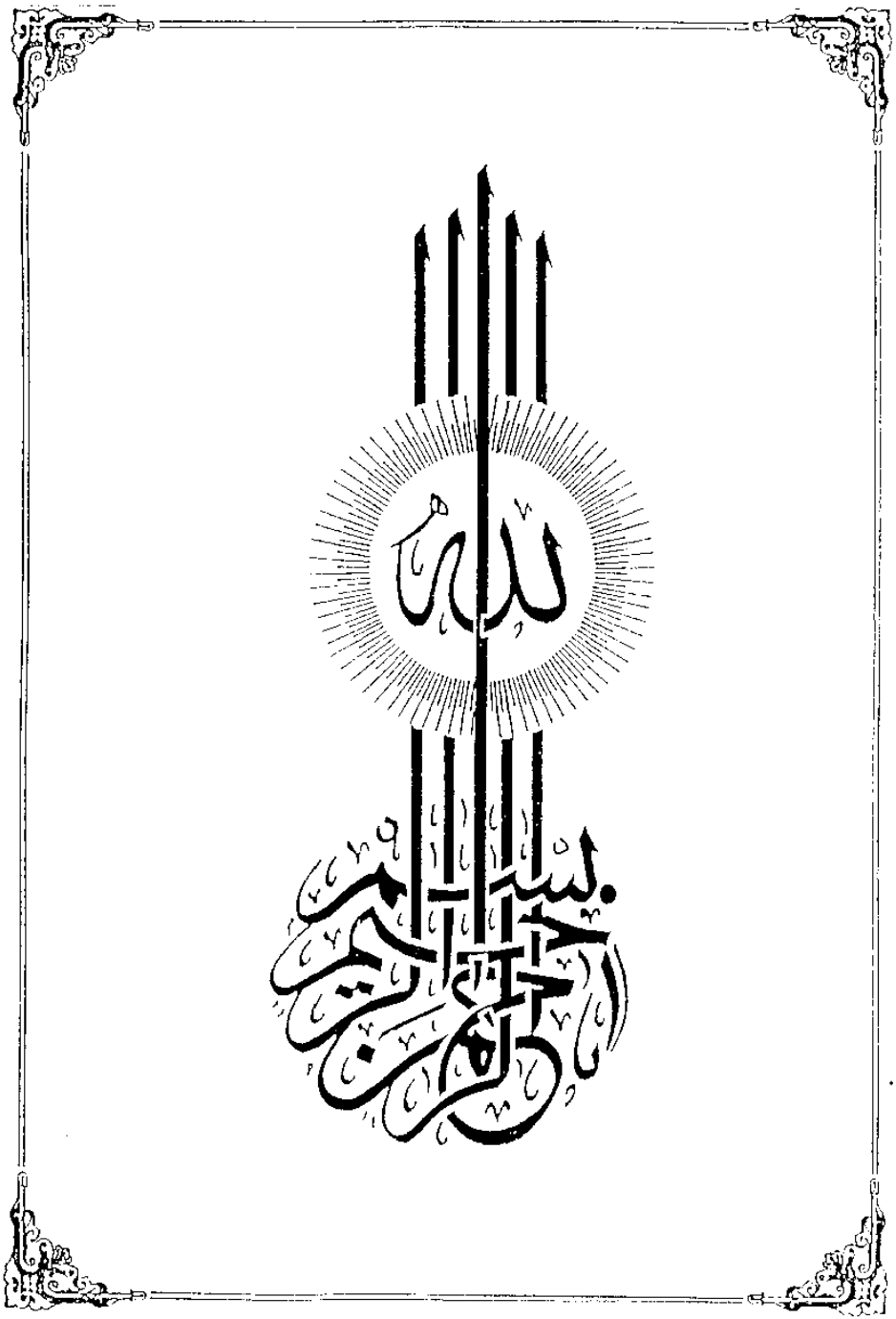

CONTENTS

HISTORICAL REVIEW

Cutaneous ureterostomy appears to have been first performed by Simon in 1869, when he accidentally severed a ureter during an ovarian operation . Le Dentu in 1889, performed the first succesful deliberate cutaneous ureterostomy. These earlier surgeons transplanted the ureter to the loin. In 1921, Legueu and Papin presented their methods of transplanting the ureters into the iliac region of the abdomen, and in 1929,Beer performed the first bilateral cutaneous ureterostomy and total cystectomy, implanting the ureters through a stab wound in the groin(Lowsley and Kirwin, 1956).

INTRODUCTION

Ureterocutaneous implantation is the direct anastomosis between the ureter and skin in the form of a cutaneous ureterostomy.

Ureterocutaneous implantation or cutaneous ureterostomy is the simplest mean of diverting the urine. It offers an effective, simple method of supravesical urinary diversion, provided that ureters can be exteriorised as a single stoma, and placed in such a manner that it can be fitted with a good collection device with the avoidance of intubation. This goal is difficult to achieve with normal ureters because of the poor intrinsic blood supply to the distal ends, so it is indicated when the ureters are dilated and tortuous. With obstructed, dilated and tortuous ureters, a sufficient length of the ureter can be mobilized without jeopardizing the blood supply, to reach the skin and maintain a patent stoma. Also, the ureter must have some peristalsis since gravity plays only a small role in the transport of urine from the renal pelvis down the ureters. Therefore, the dilated, aperistaltic ureter should not be used for cutaneous ureterostomy and instead a segment of ileum should

be substituted for the ureter as the conduit of urine (Stewart, 1982).

Ureterocutaneous urinary diversion continued to be the appropriate method of achieving adequate upper urinary tract drainage under selected and more appropriate circumstances than in the past. The effectiveness of this diversion is dependent on proper patient selection, adherence to strict anatomic principles and an appreciation of ureteral vascularity.

A variety of pathologic processes may necessitate diversion of the urine in a cutaneous fashion e.g. in severely uraemic child with neurogenic bladder, posterior urethral valves, or other congenital anomalies. In such cases cutaneous ureterostomy as a temporary procedure may be lifesaving. In the adults, cutaneous ureterostomy has been always met with a certain resistance from urologists, but in some selected cases e.g. pelvic malignancies especially cancer bladder, it may be the most appropriate and certainly the simplest technique of permanent or palliative urinary diversion.

Ureteral implantation into the skin especially after some technical modifications, is considered the safest

way for supravesical urinary diversion in certain critical and particular situations e.g. impaired hepatic and renal functions necessitating short exposure to anaesthetics

Uretero-cutaneous implantation can be performed in the form of:End or terminal cutaneous ureterostomy which may be unilateral or bilateral with double stomata or with single stoma; Terminal cutaneous ureterostomy with transuretero-ureterostomy; Loop cutaneous ureterostomy; Ring cutaneous ureterostomy, Y-cutaneous ureterostomy. Each of these forms has its own indications, advantages and disadvantages.

In general ,the choice of one of the methods of urinary diversion before urine reaches the urinary bladder is one of the unsolved problems that face urologists today because the ideal one is not yet attained.An ideal urinary diversion should fullfil certain criteria:- it should preserve renal functions, provide continence of urine and stool, be a simple technique and keep urinary and faecal streams separate.

When we compare between the cutaneous ureterostomy and the ileal conduit we find that these methods of urinary diversion share the same features i.e. (1) all are clean conduits with single stoma and one bag reseptacle (2) all seems useful in bilharzial patients with dilated ureters, especially when poor renal function contraindicates a procedure which might lead to excessive reabsorption of urinary constituents (3) the major objection in common with such procedures is the life-long leakage of urine through a hole in the abdominal wall and the necessary lifelong care of the apparatus used to collect this urinary leakage. Therefore, when permanent terminal cutaneous ureterostomy is indicated, it must be judged in relation to conduit or other urinary diversion in one hand and to primary reconstruction on the other

ANATOMY OF THE URETER

The ureters, the sole excretory passages of the kidneys, are paired expansile, whitish, fibromuscular tubes, each of them begins at the uretero-pelvic junction of its kidney and continues caudally in the retroperitoneal space to terminate in a slit-like, minute opening of valvular nature on the epsilateral side of the trigone of the urinary bladder. The adult ureter varies from 24 to 34 cm in length with right ureter being 1 cm shorter than the left. The ureter describes a gentle reverse open S-shaped curve with relatively straight midsegment. The ureter leaves the renal pelvis coursing medially over the psoas muscle immediately lateral to the transverse spinous processes and, approximately midway to the bladder, it passes behind the spermatic (or ovarian) vessels. Distal to this area the ureter is loosely adherent to the peritoneum, which is surgically important. As the ureter crosses the iliac vessels, it lies immediately above the sacroiliac Joint. At this point the ureters are only 2inches apart and promptly take an outward, backward, and lateral direction following closely the course of the hypogastric vessels in immediate proximity

to the walls of the bony pelvis. At the ischial spines the ureters are at their most widely separated point and now proceed medially toward the bladder, lying anterior to all vascular structures except the uterine and vesical vessels, and enter the bladder obliquely by passing beneath the vas deferens near its ampulla and in close approximation to the seminal vesicles.

The three points of physiologic narrowing of the ureter are the uretero-pelvic junction, the crossing of iliac artery, and the uretero-vesical junction. The iliac artery divides the ureter into two functional spindles: the proximal abdominal spindle (average diameter, 10 mm), and a distal, shorter, and smaller pelvic spindle (4 to 6 mm in diameter).

The site at which the ureter crosses the iliac vessels varies with the side and, of course, the height of the bifurcation of the aorta. Usually on the right, the ureter crosses the iliac vessels 1.5 cm lateral to their origin; on the left, the common iliac, 1.5 cm from its termination. But if the bifurcation is high, the ureters cross the external iliacs, if it is low the two common iliac vessels. It should be remembered that the bifurcation of the common iliac

is the landmark used to find the ureter at a point where it is particularly fixed, covered in front by the peritoneum to which it adheres. It is at this level that the approach is made to the ureter during the course of ureterostomy.

Blood supply of the ureter:-

The arterial supply of the ureter is of multiple origin: branches of the renal artery for the upper third of the ureter and the renal pelvis; branches from the aorta, iliacs, inferior mesenteric, deep hypogastric, and spermatic or ovarian arteries for the middle third of the ureter; and branches of the vesical and vasal arteries in the lower third of the ureter. There is a free anastomosis of these vessels in the adventitia of the ureter and renal pelvis, and through perforating arterioles, these vessels anastomose freely with the longitudinal muscular and submucosal precappillaries. This anastomosis is of such magnitude that the arterial supply of the ureter may be outlined by injecting any one of its several arteries of supply. Hence, interruption of the arterial supply does not afford significant ureteral ischaemia, which explains the well-known surgical fact that the ureter