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A short history of bladder exstrophy

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The first description of bladder exstrophy was noted on Assyrian tablets nearly 4000 years ago. Since then various papers has been published with an increasing rate. According to the available historical data, almost all operative techniques had been described during the last two centuries. We believe, the pioneers put a lot of work in this field and passed on their theoretic knowledge and surgical experience to the current era. Our duty is keep this treasure and add the benefits of recent new technological developments for the future care of our bladder exstrophy patients.

Historical background

The first description of patients with exstrophic bladder was noted on an Assyrian tablet in 2000 BC. This document has been protected in the archives of British Museum.[1] Similar congenital anomalies have been recorded as a myth on Sumerian clay tablets from 3500-2000 BC.[2] In 1597, Schenkii von Grafenberg presented information about this anomaly, and this document was probably the first written one after the Assyrian tablets.[3,4]

Fredericus Ruysch described a patient with bladder exstrophy and presented his findings and drawings from postmortem dissection in 1670.[5] Cornelius Stalpart van der Wiel published a medical report of an exstrophy in a boy and provided his descriptive schematic drawings in 1686 (Figure 1).[6]

Johannes Veltkamp[7] was the first physician who designed a urine collector, the so-called "receptaculum," for a male exstrophy patient (Figure 2). In 1780, François Chaussier was the first to use term "exstrophie," and Mowat in 1784 wrote the first detailed description of this clinical entity.[8]

In 1791, Andreas Bonn published the postmortem examination results of 5 cases with bladder exstrophy. Although his observations were quite descriptive, he did not mention any method to treat this particular abnormality.[9]

In 1828, a very interesting concept was proposed by Earle. To get rid of the open exstrophic tissue, he used cauterization and application of caustics to promote sturdy and wide scar tissue for the coverage of the defect.[8]

In 1849, Mackay and Syme, advised the use of an external urinary appliance for the collection of urine in a receptacle.[10] Syme brought forward the idea of ureterointestinal anastomosis in 1852 performing ureterosigmoidostomy in an exstrophy patient. However, the long-term result was not successful.[11]

In 1894, the technique of "transplantation of the trigone to the rectum" was described as a rescue operation for ureterointestinal anastomosis.[12] Later, Coffey,[13] Nesbit,[14] and Leadbetter[15] introduced new methods by creating antireflux mechanism. However, this technique was associated with complications, such as electrolyte imbalance, urosepsis, and development of cancer.

In 1871, "the coverage of the bladder" concept was successfully carried out by Maury by use of the technique of

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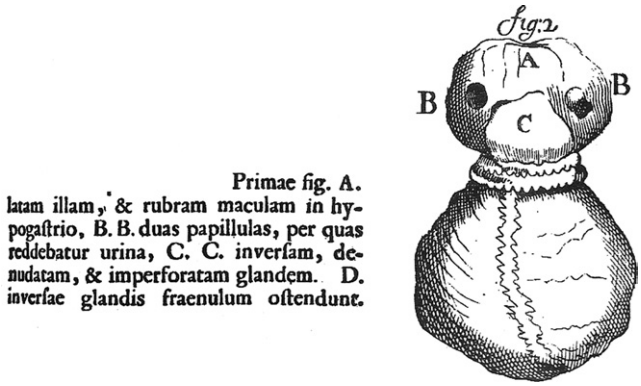

Figure 1 Schematic drawing of a boy with exstrophic bladder by van der Wiel.[6]

Roux. He used abdominal and scrotal skin flaps to cover the open bladder surface. In 1885, Wyman was the first to close a bladder exstrophy in a neonate.[8]

Trendelenburg introduced bilateral sacroiliac osteotomy, fixation of the pelvic sling, and closure of bladder plate.[16] Because his first patient became anemic and died as the result of complications, he later designed a device called the "pelvic sling" for the immobilization of the patient and approximation of the pubic bones. Various techniques by different authors were performed until 1940s via Trendelenburg's philosophy.

In 1897, Mickulicz augmented the small exstrophic bladder by using an ileal segment.[17] This experience can be considered the first bladder augmentation and closure technique for bladder exstrophy.

In 1942, Young[18] presented first female patient with bladder exstrophy with successful closure and urinary continence. Since then, efforts to completely reconstruct the bladder accelerated. In the early 1970s the continence and success rate for total reconstruction was around 20%. With the concentrated efforts and contributions of Jeffs, Kelalis, and Ransley[19-21] 80% continence rates has been achieved.

The sections to follow represent historical comments from living, active distinguished pioneers in the field concerning bladder exstrophy:

Comments from Professor Barry O'Donnell

Any operation on a newborn or infant before 1930 (endotracheal intubation) that lasted more than an hour was almost certainly fatal. Any operation on an infant before 1945 that required blood transfusion would not have been given blood and would therefore have been fatal. The few successful exstrophy closures before 1950 were almost all in females. The standard treatment up to then was uretero-colic anastomosis of which about one third died shortly afterwards, one third went into long term renal failure and miraculously one third survived to a great age. During mid 1950s, when DI Williams was a consultant in Great Ormond Street Hospital for Sick children, attempts at closure were often deferred to six or twelve months because of aftercare and anesthesia considerations (B. O'Donnell, personal communication, August 2, 2010).

Comments from Professor Dan Young

According to the publications related with bladder exstrophy in Scottish and British literature, in early 1800s a modified Cesarean section for the females with bladder exstrophy was described by Cooper.[22] In the early 1960s the first papers related to the occurrence of carcinoma developing after ureterocolic anastomoses were published. However, instances of long survival and also pregnancy were recorded in some of the patients following uretero-colonic diversion. One such author was Arthur Jacobs though I do not have the spe-

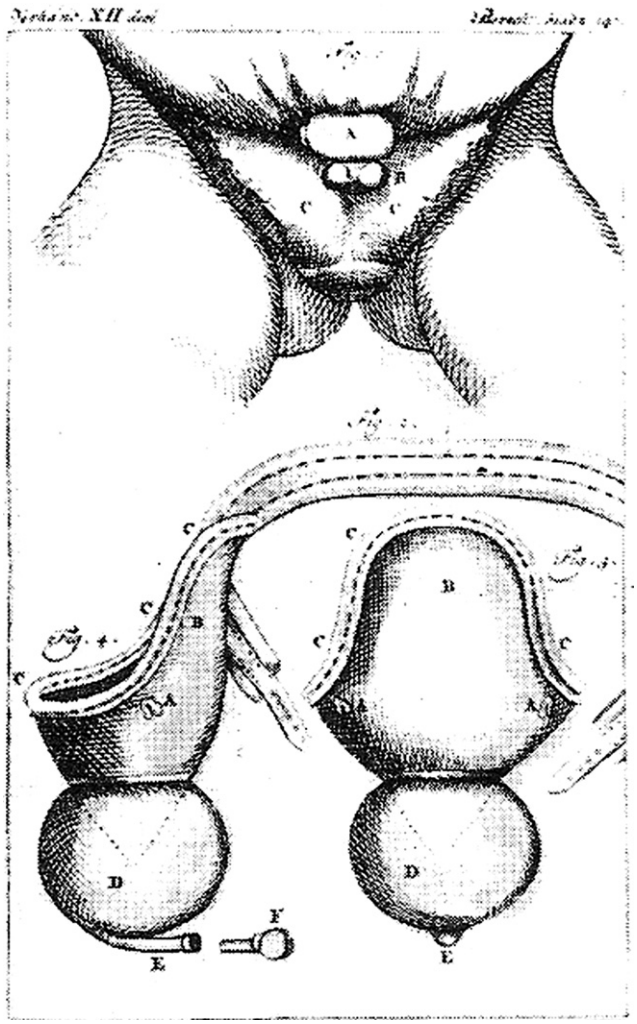

Figure 2 A urine collector called "receptaculum" designed by Veltkamp.[7]