What we need to know about urinary incontinence

Christopher Jayne, MD, FACOG, URPS, MIGS, Director from Greater Houston Urogyn, walks us through what we need to know about urinary incontinence, including comment on bladder injury research

In the United States (U.S.), the baby boomer generation is defined as those people born from 1946 to 1964. According to the 2020 U.S. census data, this generation is the second largest age group after the millennial generation. Millennials were born from 1982 to 2000 and are the children of baby boomers. By 2030, there will be approximately 73 million baby boomers, all of them 65 years or older.

Added to this statistic is that life expectancy at age 65 has almost doubled in the past century, going from 11.9 years to 19.1 years. The increase in life expectancy has primarily resulted from better overall general health. With more than half of boomers being female, this means the U.S. population of approximately 37 million aging women will need medical care for the next 30 years.

Impact of urinary incontinence on women

Urinary incontinence affects approximately 50% of women during their lifetime, with the potential to significantly compromise their physical, mental, and economic health. [(1)] Although lower urinary tract symptoms can occur at any age, aging is a risk factor for urinary incontinence. Stress urinary incontinence (SUI) is the most common type of incontinence in women, comprising 30-80% of urinary incontinence cases. [(1)] Various treatments have been described dating back to antiquity, but until recently, none had emerged as the consensus gold standard treatment.

In 1995, the synthetic mesh mid-urethral sling was introduced to treat stress urinary incontinence in women. Since its introduction, the synthetic mesh mid-urethral sling has had more publications in the medical literature than any other surgical procedure in gynecology, and many experts believe it is the consensus gold standard treatment for SUI with urethral hypermobility. [(1)] The original technique described placing the sling with a retropubic approach and recognized iatrogenic bladder, urethral, and bowel injury at the time of placement as potential adverse events.

Other adverse events included urinary retention and delayed mesh exposure. Since 1995, various modifications to the synthetic mesh mid-urethral sling have been developed to minimize these adverse events. The primary modification attempted to reduce the most common adverse event, bladder injury, has been to eliminate the retropubic approach altogether. None of the modifications, however, have eliminated the risk of bladder injury or any of the other adverse events at the time of implantation.

Bladder injury research

A literature review shows a bladder injury rate from 0.7 to 34% with the retropubic approach. [(3)] Bladder injury results in morbidity, which can be significant. Women with lower urinary tract injury recognized at the time of synthetic mesh sling placement may be required to be discharged home with prolonged use of

an indwelling Foley catheter, and intra-operative detection of bladder injury could result in abandoning the procedure altogether.

In addition, bladder injury with sling placement may result in increased postoperative pain, urinary retention, urinary tract infections, and retropubic hematoma. [4,5] Unrecognized bladder injury can lead to postoperative dysuria, recurrent urinary tract infections, urinary frequency, urgency, pelvic pain, and bladder calculi on exposed sling material. Unrecognized bladder injury resulting in mesh exposed in the bladder requires additional revision surgery with at least partial mesh sling removal and can result in a return of stress urinary incontinence. [6]

Long-term subjective cure rates for the retropubic synthetic mesh mid-urethral sling range from 51-88%. Modifications have shown similar but arguably lower cure rates. [1]

Retropubic synthetic mesh mid-urethral slings

Limited long-term data suggests that the need for repeat surgery is more likely in transobturator slings than retropubic slings. [1] A recent review also indicated that over a lifetime, retropubic synthetic mesh mid-urethral slings are both less costly and more effective than modified approaches that avoid the retropubic space. [7]

Although studies support the increased long-term effectiveness of the retropubic synthetic mesh mid-urethral sling, especially when intrinsic sphincteric deficiency is identified, many surgeons choose an approach avoiding the retropubic space due to a perceived decreased risk of intra-operative bladder perforation as well as other adverse events.

Until January 2023, no publications described a step-by-step approach to placing a retropubic synthetic mesh mid-urethral sling that eliminated the risk of bladder injury (or other adverse events). Studies have examined the benefit of standardized surgical techniques on operative times and surgical complications with data supporting standardization.

The novel “C-clamp Technique”

In an attempt to eliminate the risk of adverse events, including the most common injury when placing a synthetic mesh mid-urethral sling with the retropubic approach, the novel “C-clamp technique” was developed. This technique addresses vital factors believed to result in adverse events from the retropubic approach. Initial data was published in the Urogynecology Journal in January 2023, with follow-up data to be presented at an international women’s health conference in Bangkok, Thailand, in May 2024.

The C-clamp technique considers female pelvic anatomy mobilizing vital tissue and organs in the female pelvis to optimize placement of the synthetic mesh sling tension-free at the mid urethra with the retropubic approach. The C-clamp technique is a standardized, reproducible technique that is teachable. The preliminary results showed no adverse events with over 200 consecutive patients representing extremes of age, BMI, and surgical histories, representing a urogynecologic practice. Follow-up data to be presented reports the same success with over 300 consecutive patients.

Critical parts of the C-clamp technique include:

- Accurately identifying the mid urethra.
- Optimally dissecting the vaginal epithelium at full thickness at the mid-urethra.
- Mobilizing the bladder neck to the contralateral side and the bladder and bowel cephalad all away from the implanting trocar.

Treating stress urinary incontinence

Another key is having an instantaneous three-dimensional awareness of the tip of the trocar as soon as it enters the retropubic space and, finally, how to adjust the sling tension-free. Combined, the standardized reproducible steps of the C-clamp technique can potentially eliminate adverse events while placing the retropubic sling giving women the best chance for successful long-term treatment of stress urinary incontinence, allowing them to live happy, healthy lives.

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