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Case Report

# Innovative Tubing Management in Three-Piece Inflatable Penile Prosthesis: 'Al-Ansari Technique' for Optimizing Outcomes and Patient Satisfaction

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## Abstract

The three-piece Inflatable Penile Prosthesis (IPP) is a well-established treatment for Erectile Dysfunction (ED) that is resistant to pharmacological and mechanical interventions. While advances in device design and surgical techniques have improved outcomes, challenges in tubing management during implantation persist. Improper alignment or kinking of the tubing can lead to pump dysfunction, migration, or fluid leakage, necessitating revision surgery and causing discomfort for patients and partners. This report presents a novel intraoperative technique designed to optimize tubing placement, reduce postoperative complications, and improve patient satisfaction. A case of a 55-year-old male with refractory ED highlights the technique's clinical application. Despite prior therapies, including oral PDE5 inhibitors and intracavernosal injections, the patient's ED persisted, affecting his quality of life and relationship. After a comprehensive discussion of surgical options, the patient underwent three-piece IPP implantation with innovative tubing management "Al-Ansari technique". The described method involves deep anchoring of the tubing within the perineum using a flower-shaped suture configuration to maintain alignment, prevent migration, and enhance mechanical function.

This novel approach offers several advantages: it minimizes tube displacement and visibility, reduces discomfort for the patient and partner, and ensures smooth prosthesis operation. By securing tubing deep within the scrotum, the technique improves both functional outcomes and cosmetic satisfaction. Additionally, the stable tube alignment simplifies pump access, reducing mechanical failures and revision rates. The case emphasizes the importance of patient counseling and expectation management to optimize satisfaction and clinical outcomes. In conclusion, this innovative tubing management technique enhances IPP implantation by addressing common postoperative issues, leading to improved patient outcomes and satisfaction. Further studies are needed to validate the long-term benefits of this approach across larger patient cohorts.

## Introduction

Inflatable penile prosthesis (IPP) is known established treatment for erectile dysfunction (ED) refractory to pharmacologic therapy. The design of Inflatable Penile Prosthesis (IPP), surgical techniques, and patient outcomes all have improved with continuous advancements, the goal of implantation is to achieve the optimal prosthetic function with lower complications like infection, mechanical failure, and patient dissatisfaction. The handling and correct tubing positioning during surgery is challenging, even with improved designs, since improperly managing the tubing can lead to kinking, pumping problems, migration or fluid leakage, which may require revision surgery or cause patient discomfort [1]. Optimal prosthetic function depends on multifactor one of which is the tubing's pathway and alignment during IPP implantation. The tubing technique during IPP surgery remain a critical step to ensure optimal function of the prosthesis. This can impair the cylinders or the pump, thereby reducing patient satisfaction [2,3].

Moreover, for anatomically complex cases (e.g., following prior surgeries, fibrosis, Peyronie's disease), in order to adapt each patient's anatomical variations and prevent mechanical failures, innovative intraoperative solutions are sometimes required. The case report introduces a novel intraoperative techniques to manage IPP tubing with the objective of reducing risks associated with tubing related complications. In this case report we are describing a new technique for tubes management during IPP surgery. The new technique improve tubes alignment, reduces kinking, and promotes smoother postoperative recovery.

The report describes the technique's practical steps, evaluates the technique's feasibility in the clinical setting, and discusses the potential of the technique to improve patient outcomes by reducing revision rates, improving device longevity, and enhancing patient satisfaction.

## Case Presentation

A 55-year-old male presented with a 3-year history of erectile dysfunction (ED), which had progressively worsened despite lifestyle modifications and oral phosphodiesterase-5 inhibitors (PDE5i) use. The patient initially responded partially to tadalafil 20 mg, but over the past year, the effect diminished, with erections insufficient for penetrative intercourse. Subsequently, he was prescribed intracavernosal injections of alprostadil, which provided inconsistent results and led to painful erections on several occasions, limiting his compliance. The patient had no history of significant trauma or pelvic surgery. His past medical history included well-controlled hypertension on amlodipine. He denied smoking, alcohol abuse, or recreational drug use. The patient's partner expressed frustration with the lack of improvement, significantly affecting their relationship and quality of life. On physical examination, the penis was structurally normal, without plaques or deformity. Bilateral testes were normal in size and consistency. Penile Doppler ultrasound showed bilateral corporal venous leak, explaining the ED's refractory nature. Serum testosterone and other hormonal profiles were within normal ranges. Given the failure of both oral and intracavernosal therapies and the significant psychosocial impact on the patient, he was counseled regarding penile prosthesis implantation. After a thorough discussion of the available surgical options, including the risks, benefits, and expected outcomes, the patient opted for a three-piece inflatable penile prosthesis. Preoperative planning and patient expectations were addressed, ensuring he and his partner had realistic goals regarding postoperative outcomes.

A 55-year-old diabetic male with 3 years history of ED, which had been treated with lifestyle modifications and oral phosphodiesterase-5 inhibitors. Gradually over time, his condition had worsened. The patient initially responded partially to tadalafil 20 mg but, over the last year, had had diminishing effect, resulting in erections not reliable for penetration. He was then managed with intracavernosal alprostadil injections: response was variable and painful erection on a few occasions; compliance thus remained limited owing to such side effects. The patient denied any significant trauma and pelvic surgeries. His history included Type 2 diabetes mellitus managed with oral metformin in addition well-controlled hypertension on amlodipine. He denied use of tobacco, alcohol abuse, and recreational drugs. The patient's partner was frustrated due to the lack of improvement, which was considerably affecting the relation and quality of life. On physical examination, the external genitalia showed an anatomically normal penis, with no plaques, and no deformity. Bilateral testes were normally sized and of proper consistency. Penile Doppler ultrasound demonstrated bilateral corporal venous leak, therefore explaining the refractory nature of ED in this case. Serum testosterone and other hormonal profiles were within normal ranges. Given the failure of oral and intracavernosal medical therapy and significant psychosocial impact on the patient, he was counseled about penile prosthesis implantation. After discussing all options about available surgery, including their risks, benefits, and expected outcomes, the patient elected to undergo a three-piece inflatable penile prosthesis. A detailed discussion of preoperative planning and patient expectations was undertaken to establish reasonable goals for postoperative outcomes for both the patient and his partner.

### Description of the Surgical Technique for Tube Management in Three-Piece Inflatable Penile Prosthesis Surgery

**Fixation Technique:** The tubes are fixed with absorbable sutures at the bottom of the perineum in the dartos layer. This securely fastens them deep and straight into the scrotal sac. This point of anchorage provides a solid base that minimizes tube migration toward the penis, its kinking, or prominence under the skin or the shaft of the penis. Sutures are flower-shaped, encircling the tubes on each side at multiple points to enhance tube stability. This technique ensures distributed hold and hinders slipping or migration of the tubes within the perinium. Care is also taken not to apply undue tension on the tubing in order to avoid any mechanical tension.

### Advantages of Technique

- Tubes concealing deep in scrotum.
- Prevents Migration: The flower-like suturing ensures that the tubes are fixed in their place and stay that way, with no possibility of migration to the penile shaft at the root of the penis or into the scrotal subcutaneous tissue, which may lead to skin erosion.

- Minimizes Patient and Partner Discomfort: Anchoring the tubes deep in the perinium means the patient or his partner is less likely to feel or be disturbed with the tubing after surgery.

- Minimizing the inflation technique: Because the deeply anchored tubes within the perineum will establish a straight and linear relationship between the inflatable cylinders and the reservoir, this position ensures free, bend-free, and kink-free paths for the tubings. Furthermore, positioning therein allows excellent access to the pump within the scrotum, thus making it much easier to operate by the patient himself and further improving the functionality and ease of use of the whole system.

- Improves Long-Term Satisfaction: Good management of the tube reduces the risk of complications such as visible tubing, discomfort, or erosion, thus providing improved outcomes for the patient and his comfort level.

This procedure is a practical solution to a very common postoperative problem. In fact, this technique searches for optimal placement of the tube to enhance the patient's postoperative experience.

## Discussion

Erectile dysfunction is a frequent condition; it can seriously reduce quality of life and interpersonal relationships. While oral PDE5-i and intracavernosal injections seem to be effective first-line treatments, surgical implantation of a penile prosthesis remains an option in cases of severe or resistant ED. According to Lee & Sharifi, 2018, one of the first-line treatments for ED is PDE5 inhibitors; however, options for those patients who are unresponsive to medical treatment include intracavernosal injections or surgical interventions, which involve penile prosthesis implantation [4]. The case describes a patient with ED resistant to pharmacological and intracavernous treatment who was successfully treated by using the three-piece IPP. Penile prosthesis implantation can be regarded as a gold standard surgical treatment in patients suffering from ED who are resistant to conservative therapies. Levine et al., 2016 concluded that it is also indicated for men who prefer a definitive solution for ED or have contraindications to other treatments [5]. As such, the three-piece IPP has two advantages over malleable prostheses: a more natural erection and better flaccidity, hence a higher patient satisfaction and outcome Bettocchi et al., 2010 [6]. However, such outcomes are dependent on scrupulous surgical technique in managing the components, especially the tubing, so that postoperative complications of discomfort, migration, erosion, or pump malfunction do not ensue.

A novel technique, herein called "Al-Ansari PPI Tubing Technique," was described for tube management and applied for anchoring the tubes deeply inside the perineum using flower-shaped sutures. This technique has been developed in response to a common complication arising from IPP surgeries: tube migration, leading to discomfort, tube visibility, or mechanical failure. According to Hartman et al. (2016) [7], complications such as the migration of the tubing, kinking, or aneurysmal dilation of cylinders are bound to result in a condition that contributes to patient discomfort, visibility of the tube, and mechanical failure. Such complications do occur to show how much attention a surgeon should give during the surgical techniques to avoid post-operative complications that could affect the patient's outcome. Anchoring the tubes at the base of the perineum will serve to establish a stable and secure connection from the cylinders to the reservoir, where a straight, unobstructed pathway for fluid transfer is maintained. This position also makes pump access and functionality easier to manipulate, thus optimizing the patient's degree of inflating and deflating the prosthesis. Advantages of the innovative technique of tube management include several facets over traditional methods. Anchoring limits the possibility of tube migration into the subcutaneous tissue or along the shaft of the penis, complications connected with erosion, device failure, or dissatisfaction of the patient. Secondly, in the case of sufficient anchoring, the tubes will not migrate proximally and settle superficially in the scrotum, therefore minimizing any chance of discomfort reported by the patient. Deep anchoring also improves cosmetic results because it minimizes tubing visibility under the skin-an important consideration for the satisfaction of these patients. The flower-shaped suture configuration further provides mechanical stability by evenly distributing tension along the anchoring points and prevents slipping of the tubes over time. This feature may be of special benefit in active patients prone to mechanical complications because of the greater movement. Ensuring optimal tube placement and firm fixation further minimizes the risk of pump malfunction, as kinking/misalignment of the tube is adequately prevented. Clinical counseling and management of the patients' expectations are also important (Figure 1). Though the IPP has enjoyed high satisfaction rates among the patients, they and their partners need to be fully informed regarding the surgical procedure to be adopted, possible complications, and expectations of actual postoperative outcomes. In this case, the patient and his partner were involved in decision-making, an important aspect of clinical shared care. Such knowledge about surgical advantages and limitations appropriately aligned the postoperative expectations, hence their satisfaction. This case thus illustrates that surgical innovation is an integral component of improved patient outcomes from penile prosthesis implantation. Described in the paper is the "Al-Ansari technique" of tubing fixation as a promising solution to some of the common postoperative challenges, which can further improve clinical outcomes and patient satisfaction. In order to establish long-term efficacy and reproducibility of this technique, further research in larger cohorts is required. Nevertheless, this case offers

a glimpse into the rapidly developing area of penile prosthesis surgery and serves to emphasize the importance of individualized surgical techniques in patient management.

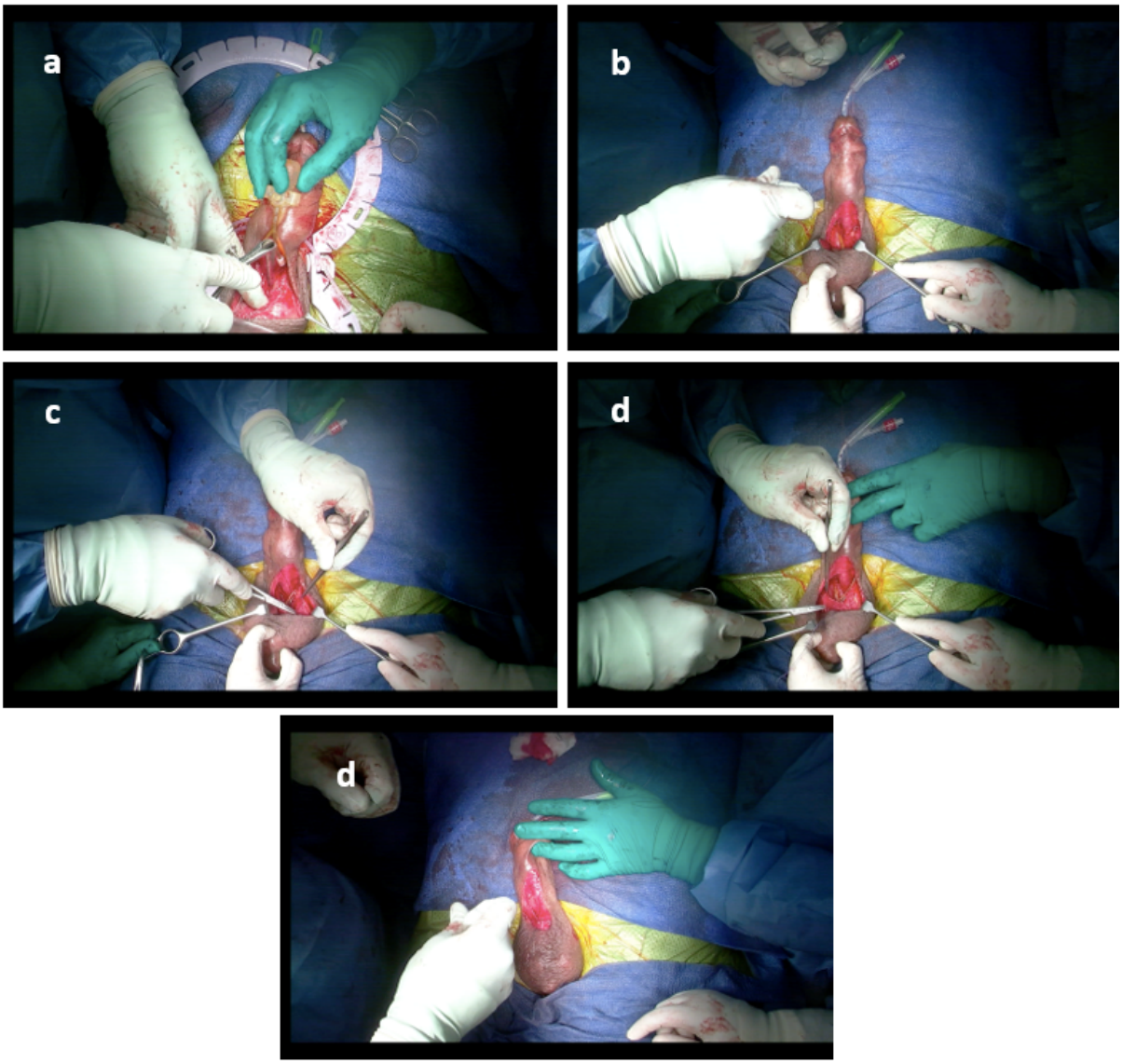


**Figure 1: a:** Sub-dartos pouch is created within the scrotum by Hartmann-Halle Nasal Speculum; **b:** Initial anchoring point at lateral deep dartos fascia using absorbable sutures; **c:** Another anchoring point at the contralateral deep dartos facia; **d:** Completing the flower-shaped configuration, encircling the tubes at multiple points; **e:**Final appearance of the dartos wound after applying Al-Ansari PPI Tubing Technique.

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