

Table 8. Surgical Penile Options

Author Year; Country Score Research Design Total Sample Size	Methods	Results
<p>Pang et al. 2022 Systematic Review N=11 studies; 475 men with SCI</p>	<p>Introduction: A penile prosthesis (PP) may be inserted for erectile dysfunction (ED) and/or urinary management in men with spinal cord injury (SCI). This group of patients is considered high risk for complications due to their reduced mobility and sensation.</p> <p>Objectives: To identify the complication and satisfaction rates following PP insertion in patients with SCI.</p> <p>Methods: A systematic review of the literature was performed according to the PRISMA checklist. The Medline/PubMed and EMBASE databases were searched up to July 27th 2021. Studies on men ≥18 years who had a PP inserted for ED secondary to SCI were included. Two reviewers independently screened all articles, assessed for risk of bias and performed data extraction.</p>	<ol style="list-style-type: none"> 1. Eleven studies including 475 men with SCI were included for analysis. 2. The overall complication rate was 4.2-61.1%. Specific complications included infection - 0-16%; erosion - 3.7-11.1% and mechanical failure - 0-16.7%. 3. The explanation rate was 2.1-16.7% and the revision rate was 2.7-44.4%. 4. Overall, 79.2-92.9% of men were satisfied with their PP and 36-86.1% were having satisfactory sexual intercourse. 5. In those who used the PP for urinary management ± ED, 86.5--92.8%% were satisfied. 6. Men with SCI had higher rates of complications compared to those without SCI (infection, 2.1-9.1% vs non-SCI, 0.8-5.7%; erosion, 2.1-8.3% vs non-SCI, 0%; explantation, 2.1-8.3% vs non-SCI, 0.8-5.7%).
<p>Glina et al. 2024 Pre-post Level 4</p>	<p>Population: 5 men with SCI (no further details – preliminary results only).</p>	<ol style="list-style-type: none"> 1. 5 patients were successfully implanted with CaverSTIM.

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N=5 men with SCI	<p>Treatment: CaverSTIM was implanted subcutaneously via extraperitoneal video laparoscopy procedure.</p> <p>Outcome Measures: Patients were followed for 6 months. Erectile function was assessed pre-implantation and at 44, 90, and 180 days post-surgery using the International Index of Erectile Function (IIEF).</p>	<ol style="list-style-type: none"> 2. No serious adverse events were observed and the device was well tolerated. 3. IIEF 6 scores were collected prior to implantation and at 44 days post-operative in 4 patients. 4. 3 of the 4 patients improved their scores in one category (e.g., moderate erectile dysfunction to mild erectile dysfunction) and 1 patient experienced more erectile dysfunction post-implantation.
<p>Lemos et al. 2022</p> <p>Brazil Longitudinal Level 2 N=30</p>	<p>Objective: This study aimed to assess the impact of the laparoscopic implantation of neuromodulation electrodes (Possover-LION procedure) on mobility and on sexual, urinary, and anorectal functions of people with chronic spinal cord injury (SCI).</p> <p>Population: N=30 (7F;23M), Mean age: 35.5, Time since injury: 7.3 years, 5 Cervical, 25 Thoracic, AIS: 21A/8B/1C</p> <p>Treatment: Possover-LION Procedure for bilateral neuromodulation of femoral, sciatic, and pudendal nerves</p> <p>Outcome Measures: WISCI, Mobility Assessment Tool for Evaluation of rehabilitation Score, Qualiveen, FISl, IIEF, FSFI</p>	<ol style="list-style-type: none"> 1. 20 of 28 patients reported improvement in genital sensitivity at 12-month post-operative (p<0.0001). 2. There were no statistically significant score changes in IIEF or FSFI between T0 and T12.
<p>Overgoor et al. 2015</p> <p>The Netherlands Case series</p>	<p>Population: 30 low spinal lesions (T12 (incomplete) to sacral) patients (mean age=29.5 years, range=13-59 years), 13 with spina bifida and 17 with a spinal cord injury.</p>	<ol style="list-style-type: none"> 1. Neither self-report of RE nor BCR testing can independently predict which surgery protocol should be used (7 patients reported RE, 4 of which had positive bilateral BCR; 9 patients

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Level 4 N=30	<p>Treatment: Researchers wanted to test whether self-report of reflex erections (RE) or bulbocavernosus reflex (BCR) testing was sufficient to determine whether patients should have unilateral or bilateral (surgery) to maximize sexual function.</p> <p>Outcome Measures: The integrity of the sacral-reflex-arc and DNP function was tested pre-operatively using bilateral needle electromyography (EMG)–bulbocavernosus reflex (BCR) measurements, and an interview about reflex erections (RE) ability.</p>	had positive BCR, 4 of which had RE.) 2. No significant association between BCR function and RE.
<p>Overgoor et al. 2014 The Netherlands Case series Level 4 N=40</p>	<p>Population: 40 low-spinal lesion men with no penile but intact groin sensation</p> <p>Methodology: The “TOMAX” (TO MAX-imize sensation, sexuality, and quality of life) procedure restores genital sensation in men with low spinal lesions, improving sexual health, as shown previously. It connects the dorsal nerve of the penis to the intact ipsilateral ilioinguinal nerve, unilaterally or bilaterally. This study reports on the technical aspects based on 43 TOMAX nerve transfers. 43 nerve transfers were performed on the participants.</p> <p>Outcome Measures: Data on patient selection, surgical history, anatomy of the ilioinguinal nerve and dorsal nerve of the penis, unilateral or bilateral surgery, surgical technique, complications, and patient</p>	<ol style="list-style-type: none"> 1. Regardless of origin, all patients with no penile but good groin sensation are eligible for the procedure, provided the ilioinguinal nerve is not damaged because of former inguinal surgery or absent because of anatomical variations. 2. Selection of a unilateral or bilateral procedure depends on the presence or absence of reflex erections and bulbocavernosus reflex. 3. Preliminary experience with the first three bilateral cases shows that it is technically feasible, with encouraging results. The surgical technique has evolved (described in detail, including video) to enhance outcome and reduce complications. 4. The TOMAX procedure can then be used to restore erogenous penile sensation and improve the quality of sexual health in patients with absent penile but good groin sensation.

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	information were collected prospectively.	
<p>Kim et al. 2008 Korea Case series Level 4 N=48</p>	<p>Population: 48 participants with SCI and erectile dysfunction, mean age 58.9 (range 39-74). Treatment: malleable penile prosthesis insertion. Outcome Measures: Subjective satisfaction questionnaire; possibility of intercourse.</p>	<ol style="list-style-type: none"> 1. 38 (79.2%) of the participants reported some degree of satisfaction with their prosthesis. 2. Intercourse was possible in 44 participants. 3. Complications occurred in 8 participants: 4 had infections, 2 had erosion towards the urethra and glans, 1 experienced pain due to the insertion of an overly large prosthesis, and 1 was dissatisfied with the small size of the inserted prosthesis.
<p>Zermann et al. 2006 Germany Case series Level 4 N=245</p>	<p>Population: Men with neurological impairment, n=197 with SCI; Age: mean 40.8 yrs, range 17-75; Injury level: paraplegia (n=188), tetraplegia (n=57); Diagnostic groups: urinary management (n=134), erectile dysfunction (ED) (n=60), urinary management and ED (n=51). Treatment: Penile prosthesis: semirigid Jonas (n=147), self-contained inflatable AMS Hydroflex or AMS Dynaflex (n=113), and inflatable 3-piece AMS 700 CX (n=33). Outcome Measures: Sexual intercourse success, treatment satisfaction, secure condom fixation, urinary management, adverse events.</p>	<ol style="list-style-type: none"> 1. Sexual intercourse was possible in 83.7% of individuals with penile prosthesis for ED. 2. 67% of females were satisfied with the result of their partner's treatment. 3. Adverse events: infection rate 5%, perforation rate 18.1% (semi-rigid Jonas), 2.4% (self-contained inflatable Dynaflex), and 0% (inflatable 3-piece AMS 700), respectively.