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ERECTION MISDIRECTION: PENILE REHABILITATION & TREATMENTS FOR ERECTILE DYSFUNCTION

**Gregory Harochaw
Pharmacy Manager
Tache Pharmacy
(204) 233-3469**



Nerve Function

- After careful prostatectomy where the erectile nerves are preserved they can be dormant for 12 – 24 months
- With radiation therapy the nerves are in the field of radiation
- They allow the smooth muscle to relax & allow the lacunar spaces to expand & fill with blood

Understanding Penile Rehabilitation

- Until recently the time interval to return erectile function after radical prostatectomy can be up to 2 years
- This 2 year period might be due to “neuropraxia” or transient cavernosal nerve dysfunction
- Historically, patients have been encouraged during this period to continue waiting for the return of erectile function without the need for active intervention

Understanding Penile Rehabilitation

- PO₂ Flaccid: 30 – 40mm Hg
- PO₂ Erect state: 90 – 100mm Hg
- PO₂ Arteriogenic: 65mm Hg
- PO₂ Venous leakage: 71mm Hg

- This low PO₂ can lead to ↑ collagen synthesis

Understanding Penile Rehabilitation

- Prolonged flaccid state after nerve-sparing radical prostatectomy
 - collagen deposition in the corpus cavernosum
 - lead to tissue hypoxia which can result in damage to the smooth muscle
 - lead to irreversible veno-occlusive disease (venous leakage)

Understanding Penile Rehabilitation

- This is all theoretical as it is difficult to prove how this actually starts and remains a topic of debate
- Formation of fibrotic tissue **does form** in the corpus cavernosum after a radical prostatectomy



Understanding Penile Rehabilitation

- Several studies have been performed evaluating the effectiveness of artificially induced erection after surgery:
 - PGE₁ injections
 - Vacuum devices
 - PDE-5i (Viagra, Cialis & Levitra)



Understanding Penile Rehabilitation

- Montorsi & colleagues evaluated using alprostadil injections at 1 month after bilateral nerve sparing radical prostatectomy
- Investigators found that a higher rate of recovery of spontaneous erections after 6 months compared to no treatment
- 67% of men in the study group had return of spontaneous erections sufficient for intercourse at 6 months compared to 20% of men who did not inject
- 53% of patients who did not receive injections demonstrated venous leakage vs. 17% of patients receiving injection therapy



Understanding Penile Rehabilitation

- 2 flaws in study
 - No placebo group used
 - Definition of “complete recovery” made interpretation of results challenging
- Also using alprostadil itself may lead to prevention of fibrosis in corpus cavernosum



Understanding Penile Rehabilitation

- Mulhall & coworkers followed 132 patients through an 18 month period after they were placed in “rehabilitation” or “no rehabilitation” groups after radical prostatectomy
 - Rehabilitation group took either sildenafil or intracavernosal alprostadil to induce erection 3 times weekly starting within the 1st 4 weeks after surgery



Understanding Penile Rehabilitation

- After 18 months of follow-up
 - 52% of men in the rehabilitation group (RG) reported spontaneous erections
 - 19% of men in the non-rehabilitation group (NRG) reported spontaneous erections
 - Also 64% of men in RG vs. 24% of men in NRG responded to sildenafil after the 18 months and were able to have an erection sufficient for intercourse



Understanding Penile Rehabilitation

- Limitation in this study is that it was a non-randomized study (patients chose if they wanted treatment or not)
- However, the results are in agreement with the Montorsi study suggesting a regimented rehabilitation protocol might improve overall return of erection function after radical prostatectomy



Understanding Penile Rehabilitation

- Gontero & colleagues investigated alprostadil injections at various points after non-nerve-sparing radical prostatectomy
 - 70% of patients receiving injections within 3 months of surgery were able to achieve erections for intercourse vs 40% for people receiving injections after 3 months of surgery
- Summary was that people should receive penile rehabilitation within 3 months of surgery



Understanding Penile Rehabilitation

- Raina & coworkers evaluated daily use of vacuum constriction device (VCD) within 2 months of patients receiving nerve-sparing or non-nerve sparing radical prostatectomy
- After 9 months of treatment 17% of patients using the device had a return of natural erections sufficient for intercourse vs. 11% of patients in non-treatment group



Understanding Penile Rehabilitation

- 23% of patients in treatment group reported a ↓ in penile length & circumference vs. 60% in non-treatment group
- These findings suggest that fibrotic changes leading to penile shortening and possible venous leakage might be minimized

Understanding Penile Rehabilitation

- Padma-Nathan & colleagues gave either nightly sildenafil treatment or placebo for 36 weeks starting 4 weeks after a nerve-sparing radical prostatectomy
- After 48 weeks 27% of the treatment group reported erections vs. 4% in placebo group
- 4% is extremely low & study only involved 76 patients. A larger trial may be required to extrapolate results



Understanding Penile Rehabilitation

- Raina & coworkers did a study with the use of PDE-5i after an initial protocol of penile rehabilitation using intracavernosal injections or VCD after radical prostatectomy
- Used sildenafil in dissatisfied patients using a VCD for about 4 months & found after 8 months of combined treatment 77% improvement in rigidity/patient satisfaction & 30% of patients with a return to natural erections



Understanding Penile Rehabilitation

- Montorsi & colleagues used a combination of sildenafil & intracavernous alprostadil injections in patients undergoing nerve-sparing radical prostatectomy
- Patients started on injections within 1 month and sildenafil after 4 months vs. sildenafil alone after 4 months
- 82% of men in combined group responded to sildenafil vs. 52% sildenafil-only group



Conclusion

- Significant fibrotic changes in the corpus cavernosum develop after a prolonged period of penile flaccidity after a radical prostatectomy
- Exact etiology is unknown although strong evidence suggest hypoxia may induce fibrotic changes
- Many physicians are using some type of erectogenic treatment after a surgery in an effort to enhance the return of sexual function



Conclusion

- Limited data shows the possible role of chronic use of PDE-5i post-prostatectomy in enhancing the return of sexual function
- Patients need to be aware that the preliminary data on the exact benefit imparted on penile rehabilitation & which treatment regimen that is most effective will remain highly controversial until better data becomes available

Treatment

- Start treatment within 4 months after prostatectomy
- Use of a PDE₅i daily or the use of an ED injection 3 times weekly for 6 months
- Use a vacuum pump to help regain length
 - Bring penis to a full erection & hold for 1 minute
 - Repeat up to 4 times over 10 minutes
 - Use on off days if using ED injection
 - Use 5 times/week for 6 months – 1 year if on PDE₅i