Conditions Causing Penile Shortening

Penile shortening is a phenomenon that is associated with certain medical and surgical conditions. These conditions include prostate cancer patients treated with radical prostatectomy, Peyronie's disease and congenital anomalies. There is also some evidence that erectile dysfunction may be an independent risk factor for shortening.

There have been several studies that have evaluated penile length after radical retropubic prostatectomy (RRP). In 2001, Munding *et al*.[15] examined penile length in 31 men who underwent RRP by a single surgeon. All men had erections that were sufficient for penetration preoperatively. Penile measurements were recorded in triplicate on all patients in the holding area prior to surgery. These were performed in the stretched flaccid condition only, from the tip of the glans to the pubopenile skin. The same measurements were taken again 3 months postoperatively. No erect measurements were recorded, nor was penile girth recorded. They demonstrated penile shortening in the stretched condition in 71% of patients; 23% of patients were found to have <1.0 cm decrease in length whereas 48% were seen to have a>1.0 cm decrease in stretched penile length.[15]

A second study published in 2003 by Savoie *et al.*,[16] similarly examined post-RRP flaccid and flaccid stretched penile lengths. Penile lengths and girth of 63 men undergoing RRP were measured pre- and postoperatively. Measurements were recorded from the pubopenile skin to the meatus, in the flaccid and stretched flaccid conditions. Penile circumference was also measured midshaft. Measurements were taken preoperatively in the holding area and then 3 months postoperatively. About 68% of patients demonstrated a statistically significant reduction in penile length in both the flaccid and flaccid stretched conditions, but interestingly, an increase in penile girth was also seen.[16] Etiology of penile shortening is unclear at the present time. Theories include early penile shortening related to urethral shortening due to RRP, or secondary corporal fibrosis from chronic hypoxia and fibrosis.

There is increasing evidence, however, that penile shortening is not limited to surgical treatments of prostate cancer. This was demonstrated by Haliloglu *et al.*[17] in 2006, when they looked at penile length in men treated with a combination of androgen suppression and radiation therapy. All subjects received hormone deprivation therapy in the form of a luteinizing hormone releasing hormone (LH-RH) agonist, (either leuprolide or goserelin) every 3 months for a total of nine injections. Twenty days of bicalutamide (50 mg per day) was given ten days prior to the LHRH agonist. External beam radiation (70 Gy) was administered in a two-phase four-field approach. Penile measurements were recorded in the stretched flaccid condition from the pubopenile skin to the tip of the glans. They found that there was a statistically significant decrease in penile length in men treated with hormonal suppression plus radiation. More specifically the men who had a pretreatment stretched length of <14 cm had a lower percentage of penile shortening compared to men with pretreatment lengths >14 cm.[17] Although the literature is limited, there is some

evidence that external beam radiation can cause penile fibrosis and ultimately penile shortening.[18] The effects of hormone deprivation alone on penile length is not known.

Awwad *et al*.[14] examined penile size on normal adult Jordanian men and in men with erectile dysfunction. Their data on 'normal' subjects have already been outlined earlier. Awwad found that when comparing normal men to men with erectile dysfunction, there was a statistically significant reduction in both flaccid and stretched penile length. More specifically, the average flaccid penile length was 7.7 cm (potent patients 9.3 cm), whereas the average stretched penile length was 11.6 cm (potent patients 13.5 cm). Penile girth of the impotent men was not assessed. authors cited loss of elasticity and la