Planning prostate cancer radiotherapy following male to female gender affirming surgery

*Introduction/Background*

Post gender affirming surgery, transwomen are left with the native prostate. The incidence of prostate cancer in transgender women is lower than age-matched *cis*-male counterparts. Options for treatment will vary depending on grade and stage of prostate cancer but must also take into consideration their wishes to have (or not) gender affirming surgery in the future. Radiotherapy can be a good option in transgender women following gender affirming surgery but little is published about how pelvic anatomy may be affected by such surgery and therefore how to plan subsequent radiotherapy.

*Specific Aim*

The aim of this study was to provide guidance on changes in pelvic anatomy specifically following vaginoplasty which may affect how radiotherapy is delivered, in order to reduce to a minimum collateral radiotherapy damage.

*Materials and Methods*

We reviewed MRI images of 15 transgender women following gender affirming surgery (vaginoplasty) to assess the anatomical changes of the key landmarks used in planning radiotherapy. We defined these key landmarks as the bladder, rectum and penile bulb.

*Results*

The bladder position remains consistent irrespective of the surgical technique used, size of prostate and age of patient.

A thin, fibrotic, stenosed or short neovagina made from penile skin will have almost no impact on rectal position relative to the prostate. However, the use of a thicker penoscrotal pedicled flap can have a dramatic impact on the recto-prostatic space. In the same way that a neovagina constructed from bowel or a more "distended" neovagina will push the rectum posteriorly lifting it away from the prostate. In radiotherapy terms this may offer some dose reduction and protection from late rectal effects.

The remaining corpus length is quite widely variable ranging from 2.5 to 5 cm. More variable however is the bulk or volume of the corpus and thus the penile bulb. The position of the bulb is fairly consistent relative to prostate but the degree of scarring and fibrosis varies. A scarred penile bulb may not suffer much from further radiotherapy, but the urethra might be potentially compromised more rapidly than it would have been without previous surgery.

*Conclusion*

The anatomical position of the rectum and penile bulb can change following gender affirming surgery and this may have implications when planning radiotherapy for prostate cancer in the future. It is useful to have an understanding of these anatomical variations to reduce collateral radiotherapy damage.