Specific Aims

We aim to determine if longer time from radiation is associated with increased incidence of infection or erosion of the implanted artificial urinary sphincter (AUS) in order to more accurately inform patients of surgical risks and encourage patients and providers to seek timely treatment for stress urinary incontinence. We know that radiation damage evolves after the acute period, causing progressive devascularization and fibrosis of radiated tissue. This can lead to poor wound healing and infections, especially after a trauma such as surgery. We know that AUS that are implanted in a radiated field have a shorter lifespan, mostly related to increased erosion and infection rates. However, we do not know if AUS which are implanted many years after pelvic radiation, versus 0-2 years after pelvic radiation, are at increased risk of infection or erosion. This information is critical in counseling patients on realistic expectations for AUS lifespan and modifying surgical technique to reduce the risk of infection/erosion in the most high risk population.

Our research project aims to compare the overall lifespan of AUS as well as infection and erosion rates of AUS based on time from radiation therapy to AUS implantation. We are interested in virgin AUS placement as well as subsequent revision/replacement surgeries. We hypothesize that AUS placed a longer time after radiation are at increased risk of infection/erosion and have a shorter device lifespan. Other authors have shown that radiation damage is progressive and sequelae of devascularization, such as radiation-induce ureteral strictures, continue to evolve even 20 years after radiation has been delivered. Based on this information we believe AUS devices placed at longer intervals after radiation are at higher risk of infection and erosion. We have already completed a preliminary study of this in a two-institution database and have seen a trend towards increasing erosion and infection rates however we need a larger sample size to come to a more definitive conclusion.

Aim 1 will be to determine infection and erosion rates of AUS implanted in radiated patients. We will collect data on timing of radiation and device lifespans to determine the association between radiation and timing of AUS implantation.

The proposed study will determine if there is an optimal time frame for AUS placement in men who have received radiation for prostate cancer. We suspect that devices implanted sooner after radiation will be less likely to develop infections or erosions. This information would be important for counseling patients, altering surgical technique in the highest risk patients, and provide impetus to streamline patient referrals to urologists who are able to provide treatment for stress urinary incontinence.