

Prostate Gland Capsule: Fact or Fiction?

Among the many mysteries of the Prostate Gland is the question of where it begins and where it ends. For decades Urologists and Oncologists have sort of assumed there was a capsule.

Having worked with prostate cancer patients for nearly 30 years, I learned long ago that there is no true prostate capsule, and that many treatment failures, including radical prostatectomy, Cryosurgery, HIFU, Brachytherapy (as monotherapy), and many other modalities, result from the absence of a true capsule. In reality the prostate is more akin to an egg without the shell; an orange without the peel.

Despite this the presence of a capsule would certainly be helpful in describing the location of tumors, the extent of cancer and in designing the treatment plan. Otherwise there might be a lot of guesswork.

“The capsule” has been used as a sort of delineator of prostate cancer stage. Is the cancer contained in the “capsule,” or has it “escaped the capsule?” This is an important piece of information, as it would determine whether any type of focal therapy, especially radical prostatectomy could adequately treat the disease, and how the radiation plan would be designed to reach cancerous tissue beyond the “capsule.” Cancer outside the capsule presents challenges to any chosen treatment protocol.

But take a look at this, found on the “Teach Me Anatomy” website:

“The prostate is commonly described as being the size of a walnut. Roughly two-thirds of the prostate is glandular in structure and the

remaining third is fibromuscular. The gland itself is surrounded by a thin fibrous capsule of the prostate. **This is not a real capsule**; it rather resembles the thin connective tissue known as *adventitia* in the large blood vessels.”

Additionally, “The **fibromuscular stroma** (or fourth zone for some) is situated anteriorly in the gland. **It merges with the tissue of the urogenital diaphragm**. This part of the gland is actually the result of interaction of the prostate gland budding around the urethra during prostate embryogenesis and the common horseshoe-like muscle precursor of the smooth and striated muscle that will eventually form the internal and external urethra sphincter.”

The American Urological Association (AUAnet.org) confirms: “The Prostate does NOT have a true capsule but an outer condensed fibromuscular band, which is an inseparable component of prostatic stroma. For convenience it is referred to in the literature as prostate ‘capsule.’ ” Its absence is not realized by most physicians. Even if there was a capsule it is completely absent at the prostate base (top of the gland) and prostate apex (bottom of the gland). These are the two most common areas where prostate cancer escapes.

As more physicians acknowledge this contrary finding, they are faced with finding new ways of describing diagnosed prostate cancers and devising accurate treatment plans. Where does one start and stop, either cutting or radiating? The word “capsule” must be eliminated from the prostate cancer language and be replaced with the more accurate “edge,” and if the tumor advances outside of the gland, this would be appropriately

labeled as “extraprostatic extension” (ePe) rather than extracapsular extension.

Younger men, age 40 to 60, are categorically told by scalpel-happy urologists, “you are young, so we need to just cut that cancer out.” Looking toward future years, the urologist wrongly implies that surgery will resolve their cancer problems and that these “young” men can go on to live cancer-free, care-free lives.

In fact, it is the polar opposite. Surgery, whether traditional open or robotic, that leaves cancer behind dooms the “young” patient to years of chasing the cancer cells which are left behind in the prostate bed (no surgery completely removes all prostate tissue), as they leak out from the prostate bed through the unguarded peripheral zone and into the body via blood vessels and lymph nodes. We have seen countless numbers of men post-surgery, whose prostate cancer had escaped this way, presumably sometime *before they underwent their operations*.

We know from advanced scanning electron microscopy images that prostate cancer resembles the “Daddy Long-legs Spider,” with a small body but very exaggerated, long **microscopic** legs (tentacles) that reach out through the edges of the prostate gland.

Urologists often take advantage of the term “capsule” as most cancers of the prostate begin on the edge (peripheral zone – PZ) and extend microscopically into tissues outside the prostate, (extra-prostatic extension – ePe). Microscopic findings are not seen on mpMRI, PET Scans, CT scans, so the Urologist benefits by telling the unknowing patient that the cancer is “contained.” Meanwhile, the Urologists’ referred Radiologists

are often accomplices in this deception by never uttering the words “extra-capsular extension” or “prostate capsule.”

Consider this: comparing prostate to breast cancer, when a woman is found to have a cancer the size of a BB, her surgeon will excise as much surrounding tissue as possible, at times even removing the entire breast. When a pea-sized tumor is found in the colon, typically 18 inches or more of bowel is removed. Bottom line is that a significant swath of cancer-free tissue is typically excised with every malignancy except for the brain, to ensure complete removal. If a tumor cannot be removed with a swath of normal tissue, then post-operative radiation is immediately arranged.

Additionally, cancer surgery should be “bloodless,” otherwise the cancer cells comingle with circulating blood, allowing them to disseminate throughout the body, leading to spread bone metastases with or without lymph node involvement.

For decades we have heard nightmarish stories of patients who went to the hospital for cancer surgeries, and later reported that “as soon as the air reached the cancer, it exploded throughout the body.” This old-timers’ evaluation was actually the experience of cancer cells gaining access to the normal blood circulation and escaping through the blood stream, and not the exposure to oxygen.

The prostate gland is so vascular and entangled by so many vessels that it is impossible to make its removal a “bloodless” operation. The prostate is literally wedged between many critical structures, e.g. the bladder, rectum, neurovascular (NVB) bundles, urogenital diagram, etc.,

that there can be no successful attempt to remove a swath around the prostate as is the case with so many other cancer operations.

In prostate surgery, the gland is simply "shucked out" and as a matter of course the internal sphincter of the bladder is severed, frequently leading to incontinence issues and the potential need for life-long use of diapers. The more fortunate surgical patients will only have to deal with varying degrees of stress incontinence. Also, the NVB is typically severed leaving the man with permanent erectile dysfunction.

Most importantly, however, without a true capsule to define the surgical field, is the fact that active cancer is likely to be left behind by unknowing urologists, leaving these patients requiring post-operative radiation therapy and compounding side effects. Without post-operative treatment, the patient is doomed to experience recurrence (or more accurately, persistence) of the cancer for many years down the road, and eventually succumb to the disease.

Bear in mind that when radiation alone is utilized to treat prostate cancer, every effort is made to avoid the bladder and rectum. After surgical removal, however, the bladder and rectum fall down into the cavity where the prostate once resided (the prostate fossa or bed) making it impossible to spare these critical organs when delivering adjuvant (follow-up) radiation. So much for what the surgeon typically tells a man "if you have radiation first, we will have a very difficult if not impossible time removing the prostate if cancer returns." The reverse scenario (surgery first before radiation) is far worse. The truth of the matter is that when a man with intermediate or high risk features (Gleason of 7 or higher; PSA of 10 or

higher) undergoes appropriately designed and delivered radiation therapy, the potential that the cancer has already “breached the capsule” (ePe) is always considered and accounted for in the treatment plan.

The same intermediate and high risk surgical candidates, depending on the skill level and philosophy of the urological surgeon, often only have the identified tumor removed, leaving prostate tissue behind that either is cancerous or that could become cancerous down the road, as well as microscopic disease already outside the gland.

The post-surgery patients that we see every week in our practice are angry, depressed and anxious that their surgery did not eliminate their prostate cancer, as was initially promised by their urologist. They now face additional treatment to locate, track and then treat the cancer in places outside the gland.

The challenge for any treatment protocol is assuring that all suspect tissue is removed (or sufficiently irradiated) to conquer the disease. Again, without a capsule, it is very difficult to know where to stop treatment.

With radiation’s ability to be “sculpted” and aimed to pinpoint targets, it is possible to shape the radiation beam in innumerable ways to reach the cancerous tissue within and outside the gland, while avoiding those important structures so closely aligned in the pelvic bed. This key benefit of radiation is often denied to post-operative patients because the original structure of the gland and its neighbors has been destroyed by the removal of prostate tissue.

It would be much simpler for both the urologist and the radiologist if there was definable capsule. Given the fact that there isn’t, in my opinion

radiation clearly offers the best opportunity to halt the cancer in its tracks, at any age, wherever it may be found, and the first time. Our published results repeatedly verify this.