Tales from the Clinic: Surgery after Chemo/Radiation

In prior posts I’ve described the special circumstance of a Pancoast tumor, which is a tumor at the top of the lung that tends to grow into the spine, ribs, and sometimes the nerves going to the arm. These cases are a major challenge because surgery is often something to consider, because they often grow locally more than spreading to the rest of the body, but surgery can be a special challenge because the vertebrae are generally not considered to be resectable. But some of our cases test the limits of what might be resectable, especially since our center has an orthopedic surgeon who has done special training at a surgical center in Paris that does surgeries on the spine that are not supposed to be surgically manageable. This has led our surgeons to try some amazing and ambitious combined lung and spine operations on a few patients with lung cancer who would not have undergone surgery almost anywhere else. Is that a good thing? The patients who have done well think so, but this work has raised some tough questions, as illustrated by the case of Julia K.

Julia was a 56 year-old server in a restaurant in Maui with a history of smoking for about 30 years but having quit about a decade before having increasing left shoulder and back pain. As is typical for a waitress with presumed musculoskeletal back and shoulder pain, this didn’t send off any alarm bells, and her pain continued and worsened for about 4 months before her doctor ordered a chest x-ray, which was very abnormal and led to a CT, which revealed an approximately 6 cm tumor invading her second and 3rd ribs on her left toward the back, with what appeared to potentially be invasion or at least encroachment on the vertebrae:
Pancoast Tumor:
Chest CT at Initial Presentation

Tumor growing into/through ribs and likely vertebrae
On learning this, she left Maui and returned to her childhood home of Rochester, Minnesota (big change from Maui, I imagine), where she had an extensive workup at the Mayo Clinic. Her biopsy showed a poorly differentiated NSCLC (no histology reported), and she was subsequently decided to move to Seattle to be with and receive support from her best friend, who lived here. She was referred to me and the rest of our team for management.

After a mediastinoscopy was negative for any nodal disease, she was staged as a locally advanced on the basis of the extent of primary tumor invasion, without any evidence of nodal involvement or distant metastatic spread. We treated her with a combination of cisplatin and etoposide along with concurrent radiation to the tumor. She tolerated all of this quite well, and her shoulder/back pain resolved during treatment. After 7 weeks of chemo and radiation, she then underwent a PET/CT that showed a very good response, with the tumor now 2.8 x 2.8 cm, and with the PET uptake decreasing from an SUV of 19 before treatment to 5:
Yes, I know I’ve said that PET/CT scans after chemo and radiation are very poorly studied and potentially a big mess to interpret; though I don’t always do them, we did in her case.

These results highlighted good results, with a nice tumor shrinkage and a marked reduction in the tumor’s metabolic activity, but there was still residual cancer present, and also residual...
PET uptake. She then went to surgery, a marathon session of tag team lung tumor resection (a left upper lobectomy) coordinated with more than 12 hours of meticulous spine surgery that entailed removal of parts of the T2 and T3 vertebrae, with hardware reconstruction to replace the lost support of the removed vertebrae. Here’s what her chest x-ray looked like after all of this:

![Surgery with Spinal Reconstruction](image)

Definitely an abnormal chest x-ray, but considered by her doctors and the patient herself to be a very successful surgery. And though it took her about 4-6 weeks to recover from this extensive operation, she didn’t lose neurologic function and didn’t have significant residual pain. And her cancer hasn’t recurred more than 3 years later.

The tricky part is that the pathology from her surgery showed no evidence of any viable tumor
— a so-called “pathologic complete response” (pCR), which is associated with very favorable long term survival. With the benefit of hindsight, we can say that she might have been cured without surgery, which was a Herculean task. But when it’s happening in real time, you don’t know that the tumor has no living cancer cells if we were to examine it under a microscope.

What’s also thought-provoking is that, after a series of similar cases, a handful of other patients have had no viable tumor after an extensive surgery. In fact, at our lung cancer tumor board today, we reviewed a very recent case with the same result of a pCR in another patient who was treated with chemo and radiation at his home in Idaho and just underwent a similarly remarkable surgery. But by and large, these patients haven’t regretted their decisions, because they had visible residual tumor on the scans (which we knew were fallible).

Interestingly, today I heard someone suggest that an important clinical endpoint should be “regret-free survival”, in which we’d consider our approach a success if the patient is both alive and expresses no regret about the treatment path they pursued.

Our group debated the pros and cons of going in and doing potentially unnecessary surgery vs. taking a “watch and wait” approach in which surgery is only performed if there is evidence of local failure after potentially curative chemo and radiation. Waiting isn’t without risks, because a patient could potentially have metastatic spread, and surgery is also much harder to do with a longer time elapsing from completion of radiation. Even some of the most aggressive and experienced lung surgeons describe attempts at doing surgery in an area that was radiated months or years earlier as being like trying to cut through concrete. So there’s a risk of doing, and a risk of not doing.

The results turned out well for this particular woman, who is now living happily in Maui (and I have to imagine that most people there are living happily). I imagine that the man from Idaho will continue to be without evidence of cancer 3 or more years from now. But we can now wonder whether they would have done just as well but been spared the surgery.

I’d welcome your thoughts about whether you’d pursue the path of potential over-treatment or the path of potential under-treatment.