Radiation Oncologists' Response to Pundendal Entrapment Neuropathy

To the Editor

As radiation oncologists with special interest in urologic malignancy (JA) and radiation-induced late toxicity (RSP), we read the case report of pudendal nerve entrapment by Elahi et al (1) with interest. It was presented as the first reported (index) case of pudendal nerve entrapment syndrome caused by radiotherapy of the prostate, seminal vesicles, and pelvic lymph nodes 2 months earlier.

The standard of proof for causality should be stringent for an index case. From a radiation oncologist's perspective, this proof requires recognition of the natural history and pathophysiology of late effects. Pathologic examination of pre-operatively irradiated tissue demonstrates that two months is too early to see chronic damage (such as fibrosis) of microvasculature and neural tissue. In addition, radiation-induced damage is dose-dependent. Decades of accumulated data has determined that there is a 5% risk that a dose of 60 Gy will cause peripheral nerve damage within 5 years (2). The authors have indicated that 74 Gy was delivered to the "pelvis"; as practicing radiation oncologists, we believe that improbable. More likely, 74 Gy was delivered to the prostate with several millimeters of margin; other tissues in the pelvis had probably received a significantly lower dose.

It should be incumbent upon the reporters of an index case of toxicity to demonstrate how much dose was delivered to the tissues in question. Fortunately, modern planning technology, supported by images taken as the patient is being treated, graphically demonstrates how the dose was distributed. As shown in the accompanying figures from a typical prostate cancer treatment, the region receiving the full dose of 78Gy (encompassed by the yellow line) is limited; the pudendal nerve (HS) has received between 30 and 40 Gy, well below the threshold of toxicity.

In conclusion, the authors of this case report have not provided the necessary documentation to support their contention that radiotherapy has caused this patient's pudendal nerve entrapment. We welcome a rebuttal that includes graphic evidence that a neurotoxic dose was delivered to the damaged tissue; without it, they are simply relying on the sequence of events. *Post hoc ergo propter hoc* (precedence proves causality) is flawed logic.

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References

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2. Pieters RS, Niemierko A, Fullerton BC, Munzenrider JE. Cauda equina tolerance to high-dose fractionated irradiation. Int *J Radiat Oncol Biol Phys* 2006; 64:251-257.

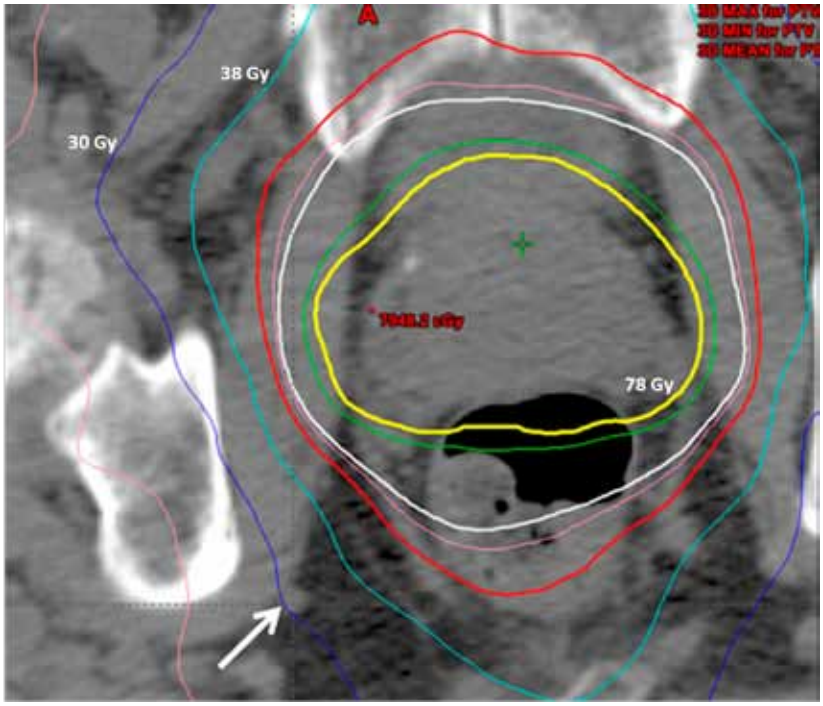

Fig. 1. Dose distribution projected on axial CT image. The pudendal nerve (arrow) received between 30 and 38 Gy (represented by the dark and light blue lines, respectively). The prostate received a dose of at least 78 Gy (yellow line).

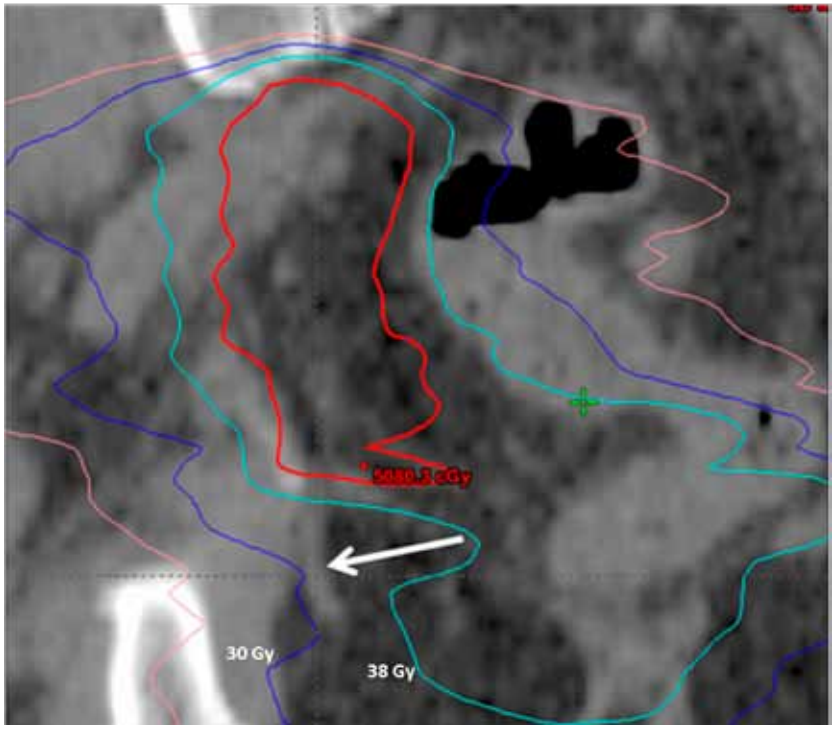

Fig. 2. *Dose distribution projected on coronal CT image. The pudendal nerve (arrow) is again seen to have received between 30 and 38 Gy (represented by the dark and light blue lines, respectively).*