Discussion to: Risk of Developing Subsequent Primary Lung Cancer After Receiving Radiation for Breast Cancer

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Discussion to: Risk of Developing Subsequent Primary Lung Cancer After Receiving Radiation for Breast Cancer

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Dr. Richard Whyte (Boston, MA):

Dr. Wong thanks very much, nice presentation and I do appreciate you sending the manuscript to me in advance. In this paper you are really examining the risk of developing breast cancer in patients that have received radiation and when I think of breast cancer and radiation and lung cancer I think of three questions, first does having breast cancer increase your risk of developing lung cancer? Secondly, is it the radiation, does radiation increase your risk of developing lung cancer and if so when, is it early or is it late? And the third thing that comes with discussion about radiation and tumors is that are those tumors worse than other non-radiation tumors, now, you sort of focused on the second thing obviously with the paper that is the topic of it and you allude to the fact that the radiation-induced ones have a higher hazard ratio for death and that is going to be one of my questions, so while the overall risk of developing lung cancer with or without radiation is much the same I think it was 1.6 versus 1.7 something, but not statistically significant. Obviously the difference comes out later, years afterward which is what you would expect based on what we know about the effects of radiation on dividing cells. One thing that was interesting and it is hard to tell on those slides, you put it on the other version was that early on in six months to five years there was actually a protective effect or apparently a protective effect where relative risk was .7 or .8 in those that had radiation and I wondered how you can explain that is that simply a smoking thing which is something to correct for or an age thing and that they had potentially smoked for less time therefore a younger group of people less likely to develop lung cancer or is there something we are missing here, but that early group, the ones that got radiation actually did better and you did show it on that one slide if you look way to the left there is a little difference, but it is so far down toward the bottom it is hard to tell, but that was highly statistically significant and I wondered if you could explain that?

Dr. Lye-Yeng Wong (Palo Alto, CA):

Thank you so much for the important question, so yes that is a very granular part of this statistically heavy study that we had and we hypothesized that the benefit in the six month to five year group could be
because they possibly had a more aggressive form of breast cancer and so they were weeded out to say in an informal way so we figured we did not want that part of the data to take away from our main conclusion which was showing that the risk does increase over time, but that it is not nearly as high as historically published in so that is in the full manuscript and we do discuss that a little more, but thank you for bringing that up.

**Dr. Whyte:**

The other question relates to that, you point out that your survival curve demonstrates an increase hazard ratio with the addition of radiation it looks like it’s worse now is this because the lung cancer patients do they seem to do the same, the curves kind of overlap and is the breast cancer patients that get radiation actually do better, not the lung answer patients that do were so if you look at those hazard ratio of 1.9 to 2.5 it would suggest that the tumors in the radiated patients are more virulent whereas if you look at the data in a bit more granular fashion it appears that the breast cancer patients that get radiation actually do better and I don’t want one to come to the conclusion that these radiation “radiation induced associated tumors are worse”, can you explain that and with that I would say it is a pretty presentation, thank you.

**Dr. Wong:**

Thank you so much, yes, the survival curves are one way to look at the data and really we used patients who were not exposed to radiation and who did not develop lung cancer as our reference group and so it is a little difficult to compare the other colored lines to each other when we are really comparing all of the lines to the gray line and so there is more granularity and I think a nice follow-up study would be to look at long-term outcomes of patients who develop lung cancer after having radiation exposure from breast cancer compared to patients who receive lung cancer just in general to see if there is a difference and I think that would more clearly answer the question that you are coming at.

**Dr. Jessica Donnington (Chicago, IL):**

Great presentation, thank you, Jessica Donnington from Chicago. We talked about or you briefly mentioned radiation techniques. You know the radiation oncologists use things like B20, B50, B5, that tells them exactly what that organ is getting and I know those things and I know that is probably not data in seer, but did they mention how they were radiated
you know I think it was about 10-12 years ago that they started doing prone versus supine breast cancer radiation primarily to protect the lungs and mediastinal mass is that stuff we can find in that database?

Dr. Wong:

Yeah, thank you so much Dr. Donnington that is an excellent point and probably one of the biggest limitations in our study is that we don’t have data on radiation dosing and the specifics, however we are doing a subgroup analysis looking at the trend of radiation oncology practicing overtime to see if that has any significant effects on the development of lung cancer so that will be in a little more detail in the manuscript. Thank you.

Unidentified Speaker 1:

Do you think the point at which people get CT scans for other reasons impacts the cell?

Dr. Wong:

Thank you so much, that is also a great question and something that we do mention in the manuscript that around the year 2000 at the time that radiation oncology practices were focusing on CT guided treatment planning a lot more that was also a big uptake, a time and a big uptake of the use of generalized CT scanning’s for diagnosis and management and follow-up of different cancers so I do think that plays a role. It is hard to quantify that in this analysis, but in doing the subgroup analysis we hope that at least it gives us a little bit more of the clinical relationship with the trends over time over the last 20 years.