Rebuttal to the Cancer Journal study: Dental X-rays and Risk of Meningioma

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Greetings!

I have had numerous requests for rebuttal to the recent article entitled "Dental X-rays and Risk of Meningioma" published in the Journal Cancer dtd 10 April 2012. (http://onlinelibrary.wiley.com/doi/10.1002/cncr.26625/pdf). So to put things into perspective, here are my two cents!

The article "Dental X-rays and Risk of Meningioma" by Elizabeth Claus, MD, PhD et al is just another in a series of sensationalist, inflammatory articles on therapeutic radiation and in this case, dental radiation. It grabs great headlines but totally lacking in true science!

Unfortunately with this study, Claus and company have not devoted one sentence to the clinical benefits of Dental X-rays but elected to further perpetuate and capitalize on the public's phobia with radiation, air travel not excluded! Which is not surprising as Dr. Claus nor her PhD colleagues have any dental or radiation physics education.

Further observations:

1. Did you notice that neither the control nor the treated tumor group were questioned regarding their tobacco usage or at least it wasn't published? And the average age of both groups was 57! This was an inexcusable deletion in the study design and I suspect intentional. One must assume that a history of cigarette smoking would carry with it a higher incidence of tumor potential, benign and otherwise, than routine bitewings and a Panorex, all necessary for our dental health.

2. *"Those with tumors were more than twice as likely as the others to report having more frequent bitewing X-rays and Panorex X-rays especially at a young age".* One would expect along with an unhealthy lifestyle there would be a greater need for dental care with increased caries, periodontal disease, etc. especially with cigarette smoking. All of which are far more rampant than benign meningiomas which affect less than 1% of the population.

3. *"Many people are having them (X-rays) every six months or every year when the American Dental Association is saying once every two to three years".* The ADA is not looking into your mouth (fortunately!) and the reason why most of us rely on our dentist to make that call.

4. Where would your health be today without proper dental care? Dental health affects 100% of the population yet less than 1% may contract a benign

meningioma. Those with excellent dental care are amongst the healthiest population and it stands to reason that they will also be in better position to dodge the meningioma bullet. I think its time that the American Dental Association recognizes that fact instead of making perpetuating lame excuses for the benefit that dental X-rays afford us.

5. *"Risk estimates for full-mouth films, although not statistically significant, were consistently in the same direction as for the other 2 film types".* How can a full-mouth series which consist of 18-20 individual films not be statistically significant with 18-20 times more radiation! With their obvious limited research and understanding, I suspect that the authors were not even aware that a full mouth X-ray exam consists of 18-20 bitewing type exposures. A level of radiation which is still insignificant and for which there has never been a known biologic side effect! And today, the use of digital imaging with it's further reduction in exposure, reduces this studies' credibility even further.

6. The Effective Radiation Dosage value is used today in order to quantify the level of risk from different X-ray procedures and compare them to naturally occurring sources of radiation. The unit for this Effective Dosage Radiation is the Sievert. We are obviously exposed to radiation from natural sources every day. On average we are exposed to an effective dose of about 8 uSv <u>micro</u>sievert, (not <u>milli</u>sievert, mSv) per day from naturally occurring radioactive materials and cosmic radiation from outer space. High altitude long-haul commercial airline flights add an <u>additional</u> dose of 30 uSv.

7. For comparison, the radiation exposure from an average single film-based bitewing is approximately 5 uSv, less than the 1 day 8 uSv natural radiation exposure we all receive just being on the planet Earth. How can several bitewings even in a one year or 40 year period result in a meningioma? A standard Medical CT scan of the mandible is 1400 uSv's - the equivalent of 5 <u>months</u> natural radiation exposure! It would take 280 bitewings to equal the patient radiation of just 1 Medical CT scan and who gets just one CT? Why is this study not going after Medical CT's? Because of course it doesn't capture the headlines any longer.

So what does it all mean? We are inundated with such comparisons, often conflicting, due to the myriad of variables, age of the research, age of the equipment and software used, phantom/model construction, etc. and the fact that the formulas used are not true science but based on theoretic tissue weights.

Just eleven years ago, the radiation physicists thought they had it all figured out and then in 2007, they changed the weight factors, significantly, once again! All based on theory!

Where does this leave you and your patient? I have enclosed a good, average, comparison by the Health Physics Society in addition to another synopsis - for those of you who like numbers.

We readily accept the radiation burden in a bitewing or full mouth exam because of the obvious benefits for our well being. When we order any X-ray exam, we have made the determination that the benefit outweighs the risk and the risk of such exams are much less than those risks we commonly accept in daily life.

Best regards,
Dick

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