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Giovanni Mauri & Luca Maria Sconfienza

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Image-guided thermal ablation might be a way to compensate for image deriving cancer overdiagnosis

Dr. giovanni mauri* -Istituto Europeo di Oncologia, Division of Interventional Radiology, Milano, Italy

Prof. Luca Maria Sconfienza- IRCCS Istituto Ortopedico Galeazzi, Milano, 20100 Italy ;

Dipartimento di Scienze Biomediche per la Salute, Università degli Studi di Milano, Milan, Italy

*Corresponding Author - vanni.mauri@gmail.com

Dear Sirs,

we read with great interest the paper by Kim et al. entitled “Radiofrequency ablation of low-risk small papillary thyroidcarcinoma: preliminary results for patients ineligible for surgery” recently published in the International Journal of Hyperthermia [1]. In this paper, Authors reported on the successful treatment of six patients with small papillary thyroid carcinoma (PTC) with radiofrequency ablation. This paper provides an extremely interesting and novel point for discussion in the actual debate regarding diagnosis and treatment of small PTCs.

Thanks to the improvement in imaging techniques and interventional skills, thyroid nodules as small as few millimeters can be detected and biopsied, making easier to diagnose thyroid cancers in their very initial phase [2]. Unfortunately, early diagnosis of a cancer does not always represent a benefit for the patient. It may happen that a cancer is detected so early, in a situation in which is so indolent or stable that it would not have become evident during the subject’s life without the medical act of preclinical detection. This may occur either because the cancer does not progress or because the rate of progression is so slow that the patient dies of other causes before it determines any symptoms. These cases can be reported as overdiagnosis. This phenomenon is of particular

relevance when dealing with thyroid cancers, where the most prevalent by far is papillary subtype, a very indolent kind of tumor with a good prognosis and a reported nearly-95% 30-year survival [3]

Moreover, detection of a cancer determines great anxiety in patients, and always trigger intensive treatment. As a consequence, the number thyroidectomies performed after early detection has risen, with a related increase in costs, anxiety for patients, and potential complications [4]. However, when a treatment is provided for a disease that would have never affected the patient life, this can be regarded as overtreatment. The problem of overdiagnosis and overtreatment is so relevant in thyroid cancer that some authors provocatively proposed to turn off ultrasound machine in order to avoid it [5].

On the other hand, once a tumor is discovered, we are somewhat compelled to do something for it. In this setting, trying to minimize overdiagnosis (by improving imaging differential diagnosis or molecular diagnosis) seems to be extremely challenging. A different option might be to reduce the overtreatment by decreasing the treatment invasiveness. Some authors suggested offering the patients with low risk tumor active surveillance in place of immediate resection [6]. However, it is highly probable that only a small minority of patients would accept active surveillance instead of surgery once diagnosed with a tumor.

In this scenario, imaging-guided therapies may play a crucial role, representing less invasive alternatives to surgery, thus being able of offering a treatment to the patients, but lowering its invasiveness. Image-guided tumor ablation has been successfully reported in several different organs (e.g. liver, kidney, lung), and in some cases ablation is now recommended as the first choice treatment in international guidelines. Regarding image guided thermal ablation for thyroid disease, the vast majority of the literature is focused on the treatment of benign thyroid nodules [7–12], while experiences of treating malignant disease are very limited, and mainly dealing with recurrences after surgical treatment [13–17]. Conversely, the potential of image-guided ablation in the treatment of primary thyroid tumors has been investigated by few authors in small series [18–

20]. In this scenario, the paper by Kim et al. [1], reporting on the positive follow up at a mean of 48 months after ablation of small PCTs provide a valuable evidence on safety and effectiveness of this approach as an alternative to surgery and active surveillance.

Last but not least, an interesting debate is ongoing about the systemic effect of local tumor ablation, as it is not clear whether local treatments may induce regression of distant metastases or may favour disease progression[21, 22]. This may be of particular interest in patients with other types of thyroid cancer with distant metastases in whom surgery is not indicated and local ablation is performed as the only palliative treatment .

In conclusion, the radiological community should be aware that the problem of overdiagnosis cannot be regarded as negligible and may be reduced eliminating inappropriate imaging. However, interventional radiologists should play a crucial role, trying to compensate overdiagnosis by reducing the aggressiveness of treatment and its unavoidable complications. Thus, we envision a scenario where minimally invasive percutaneous treatments will play an increasingly important role reducing the aggressiveness of treatments, possibly being the solution to compensate for the morbidity and mortality related to overdiagnosis and consequent overtreatment. This perspective is very close to come, but it must be accompanied by high-quality research demonstrating the effectiveness of these mini-invasive treatments over conventional surgical approaches.

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