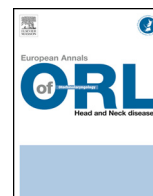




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Editorial

Anaplastic lymphoma and silicone in cochlear implants: Let's reassure



As some silicone breast implants have been suspected to be responsible for anaplastic large-cell lymphoma of the breast, the safety of use of cochlear implants, which also contain silicone, must also be assessed.

The development of anaplastic large-cell lymphoma of the breast after placement of silicone breast implants has been a hot topic over recent months. On 30 September 2018, the FDA (Food and Drug Administration) had recorded 457 cases (660 cases listed, but some duplicated cases), mainly concerning textured silicone implants (68%), but also smooth silicone implants (5%), while the surface of the implant was not specified for the remaining 27% of cases [1].

No case of lymphoma (or cancer) following cochlear implantation has been reported to date, which could be explained by four reasons (possibly interrelated): the relative rarity of cochlear implantation, the safety of the silicone used in cochlear implants, different local biomechanical conditions from those of breast implants, and resistance of the adjacent tissues to malignant transformation.

Firstly, the population of cochlear implants is much smaller than the population of breast implants (1,500 to 2,000 cochlear implants and 50,000 silicone breast implants are implanted each year in France). Anaplastic large-cell lymphoma is an extremely rare entity (the incidence of anaplastic large-cell lymphoma of the breast is estimated to be 3 cases per year per 100 million women in the United States), and would be truly exceptional in the small population of patients with cochlear implants.

Secondly, it is also perfectly possible that the silicone used in cochlear implants is safe because it is smooth, while the breast implants incriminated are essentially made of textured silicone. The quantity of silicone used in a cochlear implant (about 2 grams), in direct contact with the patient's tissues, is also much smaller than that in the context of a breast implant (several tens to hundred of grams).

Thirdly, the local biomechanical conditions are very different. Unlike a breast implant, which is mobile, the cochlear implant is fixed, which decreases friction with surrounding tissues, potentially responsible for inflammation and molecular exchanges.

Lastly, the tissues in contact with the silicone of a cochlear implant are much more resistant to malignant transformation and less susceptible to cancer (in contrast with the breast). For example, cancers of the temporalis muscle are exceptional and correspond to metastases from malignant melanoma [2], cancers of the middle ear

are very rare (especially carcinomas [3], exceptionally lymphomas [4]) and no cancers of the cochlea have been reported to date.

In conclusion, the risk of anaplastic large-cell lymphoma induced by the presence of a cochlear implant is extremely low and the situation cannot be compared to that of breast implants. We must nevertheless remain vigilant and report all suspicious cases, which also highlights the importance of an implanted device monitoring registry, even though rare and serious complications are generally reported.

Disclosure of interest

The authors declare that they have no competing interest.

References

- [1] Medical device reports of breast implant-associated anaplastic large cell lymphoma. US Food Drug Adm 2019. <https://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/ImplantsandProsthetics/BreastImplants/ucm481899.htm>.
- [2] Dalle Carbonare M, Goh MX, AlshiekhAli Z, Howlett D. Metastatic melanoma of unknown primary in the temporalis muscle. *BMJ Case Rep* 2017, <http://dx.doi.org/10.1136/bcr-2017-221577> [bcr-2017-221577].
- [3] Brant JA, Eliades SJ, Chen J, Newman JG, Ruckenstein MJ. Carcinoma of the Middle Ear: A Review of the National Cancer Database. *Otol Neurotol* 2017;38:1153–7, <http://dx.doi.org/10.1097/MAO.0000000000001491>.
- [4] Merkus P, Copper MP, van Oers MHJ, Schouwenburg PF. Lymphoma in the ear. *ORL* 2000;62:274–7, <http://dx.doi.org/10.1159/000027759>.

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