

Letter to the Editor: have 3D endoscopes succeeded in neurosurgery?

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Dear Editor,

We read with great interest the editorial by Luigi M. Cavallo, Paolo Cappabianca and Felice Esposito concerning the success of three-dimensional (3D) endoscopes in neurosurgery [3].

Since May 2011, we have been using the second generation of the 3D endoscope and we have performed more than 200 transnasosphenoidal (TNS) operations and some transcranial skull base surgeries with it. Our experience with endoscopic TNS surgery began in January 1998, and we had done more than 500 operations using the different generations of two-dimensional (2D) endoscopes when we decided to switch to the 3D technology. It is very difficult to demonstrate with evidence-based data that this technology is by itself superior to the 2D HD. In our opinion, the main fact is that human beings, and therefore surgeons, live and work in a 3D world; tumors are 3D, and vessels, nerves, and brain are all 3D in nature. For many years, neurosurgeons have been using the microscope, which is capable of rendering real 3D anatomy of various structures. Years ago, the main criticism for the endoscopic technique, applied to skull base surgery, was the lack of the third dimension, and it has been demonstrated and is our experience too, that a steep learning curve is needed to proficiently operate in a 2D environment [2]. Notwithstanding this fact, endoscopy has gained wider and wider acceptance and very experienced surgeons like the authors have published outstanding results, very difficult to improve upon. The 3D technology applied to endoscopy couples the advantages of the microscope and the endoscope [1]; moreover, the few publications existing on the matter have shown that not only is the learning curve definitely shorter, but that 3D is also more

efficient in performing delicate surgical tasks such as drilling, doing microdissection, tiny vessel coagulation and so on [4, 5]. None of the six surgeons routinely using 3D in our unit have never experienced any problem related to wearing goggles, and even scrub nurses wear them to follow the operations. There is no doubt that further technological improvement will be welcome, but even nowadays the possibility to work in a 3D surgical field, completely adhering to the real anatomy and to the different planes in which the structures are located, in our opinion surpasses any criticism, even if the resulting image is a virtual reconstruction of reality. Of course, a kind of readaptation to the perception of the real world is needed! Finally, it seems to us unfitting to compare the evolution of surgical visualization tools with those of videogames or of cinematography, which are dedicated to the general public. In those fields, 3D vision is a tool to render fiction; in surgery, 3D vision is a way to better understand reality.

Conflicts of interest None.

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