Editorial

Is Indocyanine Green Videoangiography a Good Substitute for Postoperative Digital Subtraction Angiography

It was Raabe who first described the use of indocyanine green videoangiography (ICG-VA) for intraoperative real-time analysis of blood flow within cerebral arteries postaneurysm clipping. The application of this technique has subsequently expanded both in neurosurgery and in other specialties such as plastic surgery. As rightly highlighted by Kumar *et al*., the scope of ICG angiography is vast, and it has become an integral part of cerebral aneurysm surgery.[1] The presence of residual neck following clip application, patency of the distal vessels and small perforating arteries closely related to an aneurysm, patency of anastomosis following bypass surgeries, completion of nidus excision following arteriovenous malformation surgeries, etc., remain the main indications for the use of ICG angiography. The advantages of ICG-VA are that the recurring expenditure is less, the procedure can be repeated quite often, and the relevant small perforators are seen better than a digital subtraction angiography (DSA).

ICG-VA, however, has its own share of limitations. The questions to be answered are (1) Does ICG-VA ensure proper clip placement? and (2) Is it a substitute and can it replace DSA? Unfortunately, with the available knowledge, the answer to both these questions would be in the negative. Roessler *et al*.[2] found a 9% rate of clip readjustment due to parent vessel stenosis or perforator occlusion and a 4.5% rate of residual perfusion of the aneurysm dome or neck leading to additional clip application. A similar observation has been made by many authors and it is safe to assume that nearly every sixth patient profits from the application of this technique when routinely used during cerebral aneurysm surgery. However, the wide variability in clip adjustment rates (2%–38%) suggests some degree of subjectivity and user variability in its interpretation. In this technique, only the dissected vessels within the operative field can be evaluated and there is a good chance of perivascular blood and vessel wall abnormalities such as arteriosclerotic or calcified plaques blurring the image. Moreover, remnant neck is best seen on a DSA and Roessler *et al*.[2] have observed that in 9.1% of the patients, neck remnants not seen intraoperatively were identified later on postoperative DSA. The exact reason for this limitation is not clear but could be related to the incomplete dissection of the aneurysm dome and restrictions in manipulating the aneurysm clip postapplication. For the same reason, ICG is more effective in proximal intracranial aneurysms compared to deeper aneurysms such as anterior communicating artery aneurysms where circumferential aneurysm dissection is more feasible. In addition, we have observed that presence of vasospasm also obscures complete visualization. ICG-VA does not incur recurring expenditure and can be repeatedly used. However, procurement of this software is financially challenging for most neurosurgical centers, especially in a developing country like India. In the presence of these limitations, the need for circumferential dissection of the aneurysm neck before clip application cannot be overemphasized.

Nevertheless, one cannot agree more with Kumar *et al*.[1] that ICG-VA is an important tool in the neurosurgeons armamentarium toward achieving perfection in cerebrovascular surgery, especially in an era where interventional neuroradiology is threatening its very existence.

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References

1. Kumar V, Jagetia A, Singh D, Srivastava AK, Tandon MS. Comparison of efficacy of intraoperative indocyanine green videoangiography in clipping of anterior circulation aneurysms with postoperative digital subtraction angiography. J Neurosci Rural Pract 2017;8:342-5.
2. Roessler K, Krawagna M, Dörfler A, Buchfelder M, Ganslandt O. Essentials in intraoperative indocyanine green videoangiography assessment for intracranial aneurysm surgery: Conclusions from 295 consecutively clipped aneurysms and review of the literature. Neurosurg Focus 2014;36:E7.

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