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MECHANICAL DISPLACEMENT OF ARTERIAL EMBOLUS DURING VITRECTOMY: A SIMPLER SURGICAL APPROACH TO BRAO MANAGEMENT

Anastasi M.*[1], Elena P.[2], Bonacci E.[2], Gupta A.[3], Prigione G.[4], Lo Giudice G.[5], Pedrotti E.[2], Asaria R.[3]

[1]University of Verona / Royal free hospital NHS trust London ~ Verona ~ Italy, [2]University of Verona ~ Verona ~ Italy, [3]Royal free hospital NHS Trust ~ London ~ Italy, [4]Ospedale Negrar ~ Verona ~ Italy, [5]Ospedale Civico Palermo ~ Palermo ~ Italy

The management of retinal artery occlusion (RAO) is still controversial and lacks standardised guidelines. We report a case of branch retinal artery occlusion (BRAO) in a 49-year-old man, treated with pars plana vitrectomy 22 h after onset. Also, we introduced a possible simpler surgical approach for mechanical embolus displacement.

The case report and the novel technique for managing BRAO were presented according to "Journal of VitreoRetinal Diseases" guidelines.

The surgical procedure was performed under sub-Tenon's anaesthesia using a standard 25-gauge three-port pars plana vitrectomy system (Constellation Vision System; Alcon, Fort Worth, TX, USA). A core vitrectomy was initially carried out, with intravitreal triamcinolone acetonide administered to enhance visualisation of the cortical vitreous. A posterior vitreous detachment (PVD) was successfully induced and extended to the vitreous base. Following PVD induction, intraocular pressure (IOP) was maintained at 8 mmHg via an infusion-compensated system.

Intraoperative optical coherence tomography (iOCT) was utilised to accurately localise the embolus at the proximal segment of the superior temporal artery. Initial attempts to dislodge the embolus using a 25-gauge internal limiting membrane (ILM) peeling forceps (DORC, Zuidland, The Netherlands) were unsuccessful. Subsequently, a diamond-dusted membrane scraper (DORC) was employed. With repeated, gentle manipulation, the embolus was effectively mobilised and displaced toward the superior branch of the artery, where it fragmented and became no longer visible. Restoration of retinal arterial perfusion was observed intraoperatively, indicating successful revascularisation.

A fluid-air exchange was then performed, and all sclerotomy sites were closed suturelessly.
Best-corrected visual acuity (BCVA) improved from counting-fingers to 6/9 at 1 week and 6/6 at 1 month, remaining stable at 6 months. OCT showed resolution of inner-retinal oedema with preservation of the ellipsoid zone; FA/OCTA confirmed complete reperfusion without recurrence.

To minimise trauma, we utilised the diamond duster to safely manipulate the embolus, a technique we believe offers distinct advantages over other methods.

Unlike standard soft-tip instruments, which are not specifically designed for direct retinal contact, thereby increasing the risk of retinal injury, the diamond duster, designed for ILM peeling, offers superior control and precision during embolus mobilisation. The tip can be bent in two opposing directions, providing both a firm and a soft side. This dual-surface configuration allows the surgeon to fine-tune the amount of pressure applied, reducing the likelihood of vascular or neural tissue trauma.

In contrast, ILM peeling forceps, used initially in this case, are not intended for applying direct pressure on the retina (pushing) and are therefore suboptimal for embolus displacement.

Also, unlike soft-tip cannulas, which contain a central lumen that may inadvertently trap embolic material and complicate manipulation, the diamond duster tip can be intentionally angled toward the retinal artery, allowing force to be applied through a gentle bending motion of the instrument itself and possibly embolus dislodgment by aligning the direction of force with the anatomical course of the vessel.

Finally, unlike the bimanual technique, which requires two soft-tip instruments and a chandelier light, our approach uses a single instrument without the need for additional lighting. This simplification makes the procedure less invasive (no need for the double-hand technique), cost-effective, and suitable for less experienced surgeons, without compromising surgical efficacy.

PPV with gentle, non-invasive thrombus manipulation provided by this technique can promptly reestablish retinal perfusion and meaningful visual recovery even beyond the traditional 4–6 h therapeutic window. Prospective multicenter randomised trials are needed to define the effectiveness of vitrectomy in managing retinal artery occlusion, optimal timing, technique, and patient selection criteria, meanwhile, this paper can help a clinically tailored decision on these sight-treating conditions.

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