Trigeminocardiac reflex in endovascular treatment of intracranial vascular disease

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Abstract

Since the early 1990s, Trigeminocardiacreflex(TCR) has been establis hed as a phenomenon that can occur during craniofacial surgery. Et ezadi et al. demostrated a very low incidence of the TCR during sta ndard neurosurgical interventions(2%). On the other hand, TCR is n ow being increasingly recognized during the endovascular treatmen t of intracranial vascular pathology via meningeal feeding arteries. T here are two possible explanations for these events including direct neurotoxic effect of DMSO and/or mechanical compression from On yx cast on the trigeminal nerve system. In our first case, direct com pression of the maxillary branch (V2) of the trigeminal nerve due to formation of Onyx plug produces and sends neuronal signals via th e Gasserian ganglion to the sensory nucleus of the trigeminal nerve, forming the afferent pathway of the reflex arc. Or manipultation of the CS cause compress the extensive neural interconnection in the CS could induce the TCR. In our second case, because of the tortur ousity of the arteries, navigation of the microcatheter to the distal MCA was difficult; therefore, some pushing force was applied to the microcatheter. However, the microcatheter was not advanced and te nsion aggregated within the microcatheter system. The tense micro catheter stretched the intracranial dura as a mechanical stimulus, an d is innervated by the meningeal branches of the mandibular nerve - cranial V3, which is thought to be the cause of TCR . In the treatm ent of TCR, prompt recognition of bradycardia is the first important step. Therefore, continuous and close hemodynamic monitoring dur ing neurovascular procedures is critical. Once the bradycardia is det ected, the stimulus should be quickly withdrawn and most of the pa tients will recover without additional treatment. However, intraveno us administration of anticholinergic drugs is required if bradycardia is severe or persistent. Rapid recognition and treatment of this phe nomenon leads to a favorable neurological outcome, and allows for successful endovascular embolization.



Biography

Yeon Heo is one of Korea's female neurosurgeon physician fewer than 50 people. She is a clinical fellow in the cerebro vascular field after residency training at the Asan Medical Center. Armed with sincerity and enthusiasm, she is working hard together on research and surgery today.

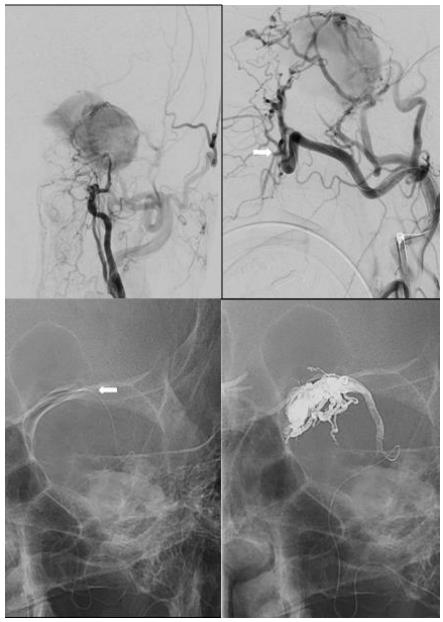


Figure1.
A 48-year-old man .Tran sarterial embolization of the fistula with Onyx was performed. While under general anesthesia, a gui ding catheter was placed in the left external caroti d artery (ECA) and a mic rocatheter was introduce d into the fistula throug h the arterial foramen ro tundum. Immediately aft er the injection of Onyx, sudden bradycardia occu rred which was followed by asystole and a sudde n drop in blood pressure d. It was resolved with in travenous administration of 20mg ephedrine and 0.5mg atropine.

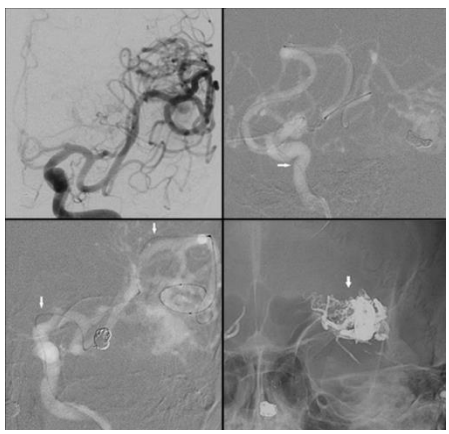


Figure 2.
A 42-year-old man .A mi crocatheter was advance d into one of the main l eft MCA feeders over a microguidewire . When we passed into the poste rior temporal feeder, we began to experience so me resistance that was mainly caused by the ma rked torturousity. When we applied some tension to the microcatheter by pushing it, the patient d eveloped sudden bradyc ardia and subsequent as ystole.

The tension was immediately released and his heart rate returned to baseline. After experiencing the bradycardia and asystole, we terminate d the procedure and the patient recovered uneventfully.

Recent Publications

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