True posterior communicating artery aneurysm



The so-called "true" posterior communicating artery aneurysm was first described by Yoshida et al. ¹⁾ in 1979. He attempted to formalize the nomenclature of aneurysms originating directly from the posterior communicating artery PCoA, 2–3 mm distal to the junction of ICA with PCoA. The PCoA vascular regional anatomy is treacherous due to the numerous perforators arising from the posterior half of the arterial wall extending from the communicating segment of the internal carotid artery, that terminate on the optic chiasma and optic tract, the floor of the third ventricle, the infundibulum, the posterior perforated substance, and the medial temporal lobe ^{2) 3)}.

True PCoA aneurysms have a larger PCoA relative to the ipsilateral P(1) segment. To He et al. knowledge, this represents the first such biomorphometric comparison of these different types of PCoA aneurysms. Although statistically smaller in size, true PCoA aneurysms also have a similar prevalence of presenting as a ruptured aneurysm, suggesting that they might be more prone to rupture than a junctional aneurysms of similar size. Further analysis will be required to determine the biophysical factors affecting rupture rates ⁴⁾.

Epidemiology

True posterior communicating artery aneurysms represent about 1.3% of all intracranial aneurysms and 6.8% of all posterior communicating artery aneurysm.

In a systematic review and meta-analysis of individual patient data, the mean patient age of symptom onset was 53.5 years, (53.5 \pm 15.4 years), and ranged from 23 to 79 years ⁵⁾.

At the time of the publication of Nery et al, 49 patients with true PCoA have been reported in the literature, with the majority presenting with rupture (89.8%). There have been no significant reported differences in ruptured status between age of occurrence (P = 0.321), left versus right aneurysm (P = 0.537) and shape of aneurysm (P = 0.408)⁶⁾.

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Treatment

Endovascular embolization is a safe and feasible procedure but may be associated with aneurysm recurrence in midterm follow-up, requiring close surveillance and potential retreatment ⁷⁾.

Although endovascular embolization has been widely used for the treatment of intracranial aneurysms, some surgeons favor microsurgical clipping over the endovascular approach considering the difficulties and risks in gaining endovascular access to the aneurysm due to its complicated vessel anatomy

Microsurgical understanding of this unique anatomy is also essential for minimizing morbidity associated with surgical clipping. It is critical to note that for true PCoA aneurysms, the neck arises distal to the origin of the PCoA, and therefore resides in what is traditionally considered an intraoperative "blind spot." The PCoA must be followed posteriorly to visualize the aneurysm neck for microsurgical clipping⁸.

Case series

Yang et al. reviewed 9 patients with this fatal disease, who were treated with endovascular embolization, and discussed the meaning of endovascular embolization for the treatment of true PCoA aneurysms.

From September 2006 to May 2012, 9 patients with digital substraction angiography (DSA) confirmed true PCoA aneurysms were treated with endovascular embolization. Patients were followed-up with a minimal duration of 17 months and assessed by Glasgow Outcome Scale (GOS) score.

All the patients presented with spontaneous subarachnoid hemorrhage from the ruptured aneurysms. The ratio of males to females was 1:2, and the average age of onset was 59.9 (ranging from 52 to 72) years. The preoperative Hunt-Hess grade scores were I to III. All patients had recovered satisfactorily. No permanent neurological deficits were left.

Currently, endovascular embolization can be recommended as the top choice for the treatment of most true PCoA aneurysms, due to its advanced technique, especially the application of the stentassisted coiling technique, combined with its advantage of mininal invasiveness and quick recovery. However, the choice of treatment methods should be based on the clinical and anatomical characteristics of the aneurysm and the skillfulness of the surgeon ⁹.

True posterior communicating artery aneurysms with or without increased flow dynamical stress: report of three cases ¹⁰⁾.

Case reports

Yang et al. described a 63-year-old woman with 1 true PCoA aneurysms in the distal portion of the

PCoA, which was treated surgically through modified pterional approach. No neurologic deficit was present at the postoperative period. Although endovascular intervention is more and more widely used in the treatment of aneurysms, the authors have also emphasized that true PCoA aneurysms in the distal portion of the PCoA can also be surgically treated in suitable patients ¹¹.

A case of a patient with a ruptured true posterior communicating artery (PCoA) aneurysm is reported, who had been managed by early endovascular parent artery occlusion with coils. The small blister aneurysm was located at the proximal PCoA itself and directed superiorly. Postoperative course was uneventful. During 1-month follow-up, the patient recovered well and could care for herself. Aneurysms of the PCoA itself are very rare. As reported to date, surgical procedures would favor microsurgical clipping over endovascular coil embolization. Endovascular treatment may be a good alternative to surgical trapping for true PCoA blister aneurysm¹².

A 53-year-old male presented with sudden onset of right hemiparesis and aphasia. Left middle cerebral artery stroke was diagnosed. Further studies revealed a 3 mm left PCoA aneurysm arising from the PCoA itself, attached to neither the internal carotid artery nor the posterior cerebral artery. Endovascular treatment was performed and the aneurysm was coiled completely.

Technical advances in endovascular interventional technology have permitted an additional approach to these lesions ¹³⁾.

A true posterior communicating artery aneurysm: variations in the relationship between the posterior communicating artery and the oculomotor nerve. Case illustration ¹⁴.

A 51-year-old male suffered a subarachnoid hemorrhage with severe headache and vomiting. A true posterior communicating artery aneurysm was recognized after repeated angiography on the seventh day. Right frontotemporal craniotomy was performed and the aneurysm was successfully clipped. The incidence of true posterior communicating artery aneurysms ranges from 0.1-2.8%, and 21 cases including our case have been reported in detail. There are no reported cases in which the aneurysm arises from the branching site of perforating arteries. In almost all cases the dome of the aneurysm projects inferiorly or posteriorly or laterally, so perforating arteries from the posterior communicating artery rarely interfere with dissection of the aneurysm or neck clipping. In a few cases, true posterior communicating artery aneurysms had been diagnosed as IC-PC aneurysms properatively, leading to intraoperative aneurysm of wide-based neck, there may be no other choice than trapping of the aneurysm. It is difficult to predict whether trapping causes postoperative ischemic complications ¹⁵.

Successful 'clipping' of the apparent neck of a posterior communicating artery aneurysm was carried out, but 2 days later the patient had a further haemorrhage and died. Postmortem examination revealed that the aneurysm was that of a rare fusiform 'true' posterior communicating artery aneurysm ¹⁶⁾.

References

1) 3)

Yoshida M, Watanabe M, Kuramoto S. "True" posterior communicating artery aneurysm. Surg Neurol. 1979;11:379–81.

Gibo H, Lenkey C, Rhoton AL., Jr Microsurgical anatomy of the supraclinoid portion of the internal carotid artery. J Neurosurg. 1981;55:560–74.

He W, Hauptman J, Pasupuleti L, Setton A, Farrow MG, Kasper L, Karimi R, Gandhi CD, Catrambone JE, Prestigiacomo CJ. True posterior communicating artery aneurysms: are they more prone to rupture? A biomorphometric analysis. J Neurosurg. 2010 Mar;112(3):611-5. doi: 10.3171/2009.8.JNS08731. PubMed PMID: 19747044.

5)

He W, Gandhi CD, Quinn J, Karimi R, Prestigiacomo CJ. True aneurysms of the posterior communicating artery: A systematic review and meta-analysis of individual patient data. World Neurosurg. 2011;75:64–72.

6)

Nery B, Araujo R, Burjaili B, Smith TR, Rodrigues JC Junior, Silva MN. "True" posterior communicating aneurysms: Three cases, three strategies. Surg Neurol Int. 2016 Jan 5;7:2. eCollection 2016. PubMed PMID: 26862441; PubMed Central PMCID: PMC4722528.

Wang C, Zhao R, Chang X, Li Q, Fang Y, Hong B, Xu Y, Huang Q, Liu J. Feasibility and midterm outcomes of endovascular embolization for true posterior communicating artery aneurysms. Neuroradiology. 2019 Aug 10. doi: 10.1007/s00234-019-02277-y. [Epub ahead of print] PubMed PMID: 31401724.

Kuzmik GA, Bulsara KR. Microsurgical clipping of true posterior communicating artery aneurysms. Acta Neurochir (Wien) 2012;154:1707–10.

Yang Y, Su W, Meng Q. Endovascular treatment of ruptured true posterior communicating artery aneurysms. Turk Neurosurg. 2015;25(1):73-7. doi: 10.5137/1019-5149.JTN.10137-13.1. PubMed PMID: 25640549.

Guo J, Chen Q, Miao H, Feng H, Zhu G, Chen Z. True posterior communicating artery aneurysms with or without increased flow dynamical stress: report of three cases. Clin Neurol Neurosurg. 2014 Jan;116:93-5. doi: 10.1016/j.clineuro.2013.10.017. Epub 2013 Nov 8. PubMed PMID: 24275337.

Yang Y, Meng X, Song J, Nie X, Zhao C, Su W. Microsurgical Treatment of Ruptured True Posterior Communicating Artery Aneurysm in the Distal Portion of the Posterior Communicating Artery. J Craniofac Surg. 2019 Jan;30(1):e5-e7. doi: 10.1097/SCS.000000000004805. PubMed PMID: 30277946.

Mitsuhashi T, Takeda N, Oishi H, Arai H. Parent artery occlusion for ruptured "true" posterior communicating artery aneurysm. Interv Neuroradiol. 2015 Apr;21(2):171-4. doi: 10.1177/1591019915583000. Epub 2015 May 7. PubMed PMID: 25953771; PubMed Central PMCID: PMC4757249.

Munarriz PM, Castaño-Leon AM, Cepeda S, Campollo J, Alén JF, Lagares A. Endovascular treatment of a

true posterior communicating artery aneurysm. Surg Neurol Int. 2014 Oct 30;5(Suppl 12):S447-50. doi: 10.4103/2152-7806.143273. eCollection 2014. PubMed PMID: 25422786; PubMed Central PMCID: PMC4235117.

14)

Sorimachi T, Fujii Y, Nashimoto T. A true posterior communicating artery aneurysm: variations in the relationship between the posterior communicating artery and the oculomotor nerve. Case illustration. J Neurosurg. 2004 Feb;100(2):353. PubMed PMID: 15086247.

Muneda K, Yoshizu H, Terada H. [True posterior communicating artery aneurysm]. No Shinkei Geka. 2001 Feb;29(2):163-8. Japanese. PubMed PMID: 11260894.

Timothy J, Sharr M, Doshi B. Perils of a 'true' posterior communicating artery aneurysm. Br J Neurosurg. 1995;9(6):789-91. PubMed PMID: 8719837.

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