Introduction

Patients complaining with vertigo or dizziness, frequently seek treatment in neurology, neurosurgery or otolaryngology clinics. Vertebrobasilar insufficiency is one of the most common causes of central vertigo or dizziness. The most common posterior circulation bypass is between P2 segment of the posterior cerebral artery (PCA) and external carotid artery (ECA) or vertebral artery (VA)1-6. However, these techniques using graft materials have some limitations, namely they are long and tend to be associated with a low patency rate4-6.

In this study, we aimed to investigate the use of a radial artery graft for bypass of the proximal STA to the proximal PCA (P2 segment) via oblique posterior transzsagittal-subtemporal approach. This surgery practiced on cadavers to make sure that this technique can be used safely on patients.

Subjects and Methods

Five adult cadaveric specimens were dissected bilaterally. Cerebrovascular dissection protocol that was approved by the Selcuk University Institutional Review Board (427/17 date of 12/04/2017) was performed. SPSS 17.0 was used for statistical analysis. A p value of ≤ 0.05 was considered significant.

Results

The mean caliber of the STA at the side of anastomosis (proximal to the zygomatico-orbital artery) was 2.25±0.35 mm (range 2.0-2.55 mm). The mean caliber at P2 segment of the PCA was 2.2±0.2 mm (range 2.0 to 2.4 mm). The average length of STA was 15.3±2.0 cm (range 13.0-17.2). The mean caliber of the proximal and distal side of the RAG was 2.5±0.25 mm (range 2.25 to 2.75 mm), 2.3±0.15 mm (range 2.15 to 2.45 mm) respectively.

Discussion

The vertebro-basilar insufficiency is a common cause of central vertigo or dizziness. Several techniques available for posterior circulation bypass surgery, such as the occipital artery (OA) to posterior inferior cerebellar artery (PICA), OA to anterior inferior cerebellar artery (AICA) or superficial temporal artery (STA) to posterior cerebral artery (SCA) or PCA bypasses, a radial artery graft from the VA to the PICA or a long venous graft from the VA to the PICA with interposed radial artery graft. Early occlusion of the graft itself seems to occur often with vein grafts. The long-term patency of arterial grafts has been higher than with venous grafts. Such a bypass is not technically more difficult than ECA to PCA bypass and does not require a second incision in the cervical region. The graft makes a bend in the area where it enters the temporalis muscle of the anterior fossa. In this case there may be an increase in blood flow. Meanwhile, it has been determined that such a bend may cause vascular instability and the blood flow may diminish and the graft may occlude. The disadvantages of the proximal STA to proximal PCA bypass using radial artery graft are as follows: 1. The anastomosis is complex as a single anastomosis, and hence has the advantage that it allows the surgeon to change the position of the head. 2. The disadvantages of the proximal STA to proximal SCA bypassing using a radial artery graft are as follows: 1. The anastomosis is complex as a single anastomosis, and hence has the advantage that it allows the surgeon to change the position of the head. 2. The dissection of the radial artery is time-consuming, and may be a reasonable alternative over “ECA to PCA” bypass using long venous grafts. Subtemporal transzygomatic approach was found to be suitable for this bypass procedure.

Conclusion

The STA to proximal PCA bypass using a short radial artery graft can provide a sufficient blood flow, and may be a reasonable alternative over “ECA to PCA” bypass using long venous grafts. Subtemporal transzygomatic approach was found to be suitable for this bypass procedure.

References

11. Funding: This project was supported by Visual Science Institute, Selcuk University.”