► Brief Note ◀

Intraoperative Angiography Using Radiolucent Multipurpose Head Frame for Intraoperative CT Scanning:

A Case Report with Basilar Bifurcation Aneurysm

Hiroshi Okudera, M.D., Kazuo Tokushige, M.D., and Shigeaki Kobayashi, M.D.

Department of Neurosurgery, Shinshu University School of Medicine

Abstract

Intraoperative angiography during clipping operation using a radiolucent head fixation system is reported. The radiolucent head fixation system, multipurpose head frame and head holder, was developed for intraoperative CT scanning. The intraoperative angiography was performed in a case with basilar bifurcation aneurysm by retrograde transbrachial catheterization of the left proximal vertebral artery. It confirmed complete obliteration of the aneurysm and preservation of the parent and surrounding arteries intraoperatively.

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Key words : intraoperative angiography, aneurysm, instrumentation, head fixation

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Introduction

Intraoperative angiography is an important procedure for vascular neurosurgery³⁾⁹⁾. Although it has been long considered as useful, previously reported techniques have been quite limited due to radiopaque surgical equipments. Several authors have developed of an exclusive instrument for obtaining intraoperative angiograms with more efficacy¹⁾²⁾⁴⁾⁶⁾⁸⁾. We performed the intraoperative angiography during surgery for basilar bifurcation aneurysm using radiolucent multipurpose head frame with head holder.

Material and method

The radiolucent multipurpose head frame, which have been developed for intraoperative CT scanning⁷⁾, was used for intraoperative angiography. The head frame is made of two kinds of advanced engineering plastics; polyamide-imide polymer and carbon fiber reinforced plastics. The

Fig. 1 The radiolucent head holder of the multipurpose head frame

patient's head was fixed using the radiolucent head holder as usual (**Fig. 1**). In this case, we used the radiolucent multipurpose head frame during the entire procedure. All the parts of the multipur-

信州大学医学部脳神経外科／〒390 松本市旭 3-1-1 [連絡先: 奥寺 敬]

Address reprint requests to: Hiroshi Okudera, M.D., Department of Neurosurgery, Shinshu University School of Medicine, 3-1-1 Asahi, Matsumoto-shi 390, Nagano, Japan

Fig. 2 Intraoperative angiography performed by retrograde injection of 20 ml of the contrast medium using an ordinary mobile X-ray unit

pose head frame were designed to keep interchangeability to that of the ordinary metallic Sugita system¹⁰⁾. Therefore, we could use the metallic accessories of the ordinary multipurpose head frame, such as the sliding base of the self-retaining retractor and the hand rest⁵⁾, together with the radiolucent frame as needed.

Illustrative case

A 67-year-old female underwent clipping operation for ruptured basilar bifurcation aneurysm and left internal carotid-anterior choroidal artery aneurysm by the left pterional approach 15 days after subarachnoid hemorrhage. Intraoperative angiography was performed through a retrograde brachial approach, just after clipping of the basilar artery aneurysm. An ordinary mobile X-ray unit was used for this purpose (**Fig. 2**). The intraoperative angiogram demonstrated complete obliteration of the aneurysm and preserved parent and surrounding arteries (**Fig. 3**).

Discussion

Recently, many investigators reported several methods for acquisition of the intraoperative angiogram^{1)~4)6)8)9)}. In 1978, Parkinson and his group designed an exclusive head holder with cassette changer for intraoperative serial

Fig. 3 Intraoperative angiogram just after clipping of the basilar bifurcation aneurysm obtained in the same direction as operative view

Head holder is barely recognized on this film (arrow).

angiography⁸⁾. Anegawa and his colleague developed a practical cassette holder for the multipurpose head frame (Sugita)¹¹⁾²⁾. Currently, Martin and his group used a carbon-composite head holder for this purpose⁶⁾.

We used the radiolucent multipurpose head frame for intraoperative CT scanning⁷⁾, which was made of engineering plastics; carbon fiber reinforced plastics and polyamide-imide polymer. The new head frame enables us to obtain practical radiological images during neurosurgical procedures.

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要 旨

術中 CT 用多目的頭蓋固定枠を用いた術中血管撮影

奥寺 敬 徳重 一雄 小林 茂昭

術中 CT 撮影用に開発された改良型多目的頭蓋固定枠を用い、術中血管撮影を行った。この術中 CT 用頭蓋固定枠は、従来のアルミ合金のかわりに polyamide-imide polymer と carbon fiber reinforced plastics を用いたもので、CT のみならず X 線撮影においても十分に radiolucent である。また、固定用のネジや枠のサイズを従来型と同じとしたため、多くの部品を共用できる利点をもつ。

症例は破裂脳底動脈瘤の患者で、あらかじめ上腕動脈より逆行性に挿入したカテーテルを用い、動脈瘤クリッピング直後に術中血管撮影を行い、クリッピングの確認に有用であった。

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