

Robot assisted angiography

VIR-2 is safe and feasible, and can achieve the catheter remote operation and angiography; the master-slave system meets the characteristics of traditional procedure. The three-dimensional image can guide the operation more smoothly; force feedback device provides remote real-time haptic information to provide security for the operation ¹⁾.

From March to September 2013, 10 patients had undergone robot-assisted cerebral angiography. There were 6 male and 4 female patients; aged from 19 to 58 years, with an average age of 38.4 years. The operation were carried out by neurosurgeons and vascular interventional robot. After successfully implanted of femoral artery sheath by hand, the catheter was fixed on the robot, under the guidance of navigation image the surgeon manipulate the master part and control the slave part of robot by sending command through network transmission, finally finished the whole cerebral angiography. The operation time was recorded from placing the sheath into femoral artery to finishing cerebrovascular selective angiography, simultaneously the time of staff under exposure of X ray was recorded, and the position difference between the setted targets and the actual position(positioning accuracy).

It took 25-41 minutes to finish the cerebral angiography, the average time was (31 ± 5) minutes, and the robot-assisted angiography went quickly and smoothly without surgical complications. The remote positioning accuracy was (1.03 ± 0.23) mm. The time of staff under exposure of X ray was 0 minute, the entire experimental process was basically implemented mechanization and automation.

This system basically achieves initial medical purposes, such as reducing the radiation, facilitating interventional procedures on the basis of enhancing the image navigation, shorting the [operation time](#), and improve the quality of operation ²⁾.

In 2015 a total of 15 patients received cerebral angiography assisted by a vascular interventional robot following preoperative examination, with approval from the hospital ethics committee and informed consent by the patients' families.

Robot-assisted angiography was performed quickly and smoothly without surgical complications. The remote positioning accuracy was 1.05 ± 0.28 mm. The time staff were exposed to the digital subtraction angiography (DSA) machine was 0 min. The entire experimental process was mechanized and automated.

This system achieved the preliminary purposes, including a reduction in radiation for the surgeons, facilitation of the application of interventional procedures, a decrease in operation time, and an improvement in operation quality ³⁾.

¹⁾

Tian ZM, Lu WS, Liu D, Wang DM, Guo SX, Xu WY, Jia B, Zhao DP, Liu B, Gao BF. [Experimental study of angiography using vascular interventional robot-2(VIR-2)]. *Zhonghua Wai Ke Za Zhi*. 2012 Jun;50(6):543-6. Chinese. PubMed PMID: 22943950.

²⁾

Xu W, Lu W, Liu D, Jia B, Hui R, Liu L, Zhao D, Wang D, Tian Z. [Preliminary clinical application of vascular interventional robot]. *Zhonghua Wai Ke Za Zhi*. 2014 Aug;52(8):593-6. Chinese. PubMed PMID: 25370759.

³⁾

Lu WS, Xu WY, Pan F, Liu D, Tian ZM, Zeng Y. Clinical application of a vascular interventional robot in cerebral angiography. *Int J Med Robot*. 2015 Mar 17. doi: 10.1002/rcs.1650. [Epub ahead of print]

PubMed PMID: 25782077.

From:

<https://neurosurgerywiki.com/wiki/> - **Neurosurgery Wiki**

Permanent link:

https://neurosurgerywiki.com/wiki/doku.php?id=robot_assisted_angiography

Last update: **2024/06/07 03:00**

