[1]汤可,周敬安,周青,等.联合入路中经额与经眶颧方向显露海绵窦手术的虚拟现实量化比较[J].第三军医大学学报,2013,35(02):145-148.
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Title: Exposing cavernous sinus through transfrontal vs transorbitozygomatic approach: a quantitative comparison with virtual reality system

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关键词: 海绵窦; 手术入路; 虚拟现实; 三维解剖

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摘要: 目的 通过虚拟现实系统建模和模拟，比较联合入路暴露海绵窦的手术中，经额和经眶颧方向的显微解剖特点。 方法 在Dextroscope虚拟现实系统中利用尸体头颅影像数据三维建模，构建颅中窝海绵窦的手术解剖模型。通过选取骨性标识点连线勾绘空间框架，分别模拟经额和经眶颧方向暴露海绵窦，测量比较框架内距离、面积和体积等数据。 结果 开颅骨窗三角和海绵窦术野三角之间的距离、到达海绵窦术野三角前的操作空间和经过脑组织体积比较结果为：经额方向>经眶颧方向；开颅骨窗三角面积、海绵窦术野三角面积、操作空间中暴露颅神经体积、经过海绵窦术野三角后磨除前床突体积和暴露颅神经体积比较结果为：经眶颧方向>经额方向，上述差异均有统计学意义（$P<0.05$）。经眶颧方向到达海绵窦前的操作空间中无需磨除前床突，不经过颈内动脉和大脑中动脉主干。经过海绵窦术野三角后暴露颈内动脉体积差异无统计学意义（$P=0.770$）。 结论 联合入路中经额方向在显露海绵窦位于颈内动脉内侧的病变具有优势，而利用经眶颧方向能更有效地显露颈内动脉外侧的病变。

Abstract: Objective To compare the exposure of cavernous sinus from transfrontal and transorbitozygomatic direction in combined approach by model establishment and simulation in virtual reality system. Methods Image data of CT and MRI scanning performed to cadaver heads were inputted into the Dextroscope virtual reality system to build a three-dimensional model of cavernous sinus. Simulations of transfrontal and transorbitozygomatic direction in combined approach for cavernous sinus were made by lining landmark points selected on the calvaria and skull base to form spatial frameworks. Then, the distance, area

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of surgical entry and volume of tissues in the frameworks were gauged and compared. Results Distance between craniotomy window and exposed region, volume of operative space and brain tissue involved in operative space before reaching cavernous sinus, were larger from transfrontal direction than from transorbitozygomatic direction. Triangular area of craniotomy window and exposed field, volume of cranial nerves exposed before reaching cavernous sinus, anterior clinoid process and cranial nerves exposed after entering cavernous sinus were larger from transorbitozygomatic direction than from transfrontal direction. And from transorbitozygomatic direction were larger than those from transfrontal direction. Difference of above data reached statistical significance (P<0.05). Anterior clinoid process, internal carotid artery and middle cerebral artery trunk before reaching cavernous sinus were not shown in operative space form transorbitozygomatic direction. Volume of intracavernous sinus artery after entering cavernous sinus from transfrontal direction and transorbitozygomatic direction had no statistically significance（P=0.770）. Conclusion In the combined approach, advantages exist in the exposing of lesion located medial to cavernous sinus from transfrontal direction, and the exposing of lesion located lateral to cavernous sinus is more effective from transorbitozygomatic direction.

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