Application of AI in Neurosurgery

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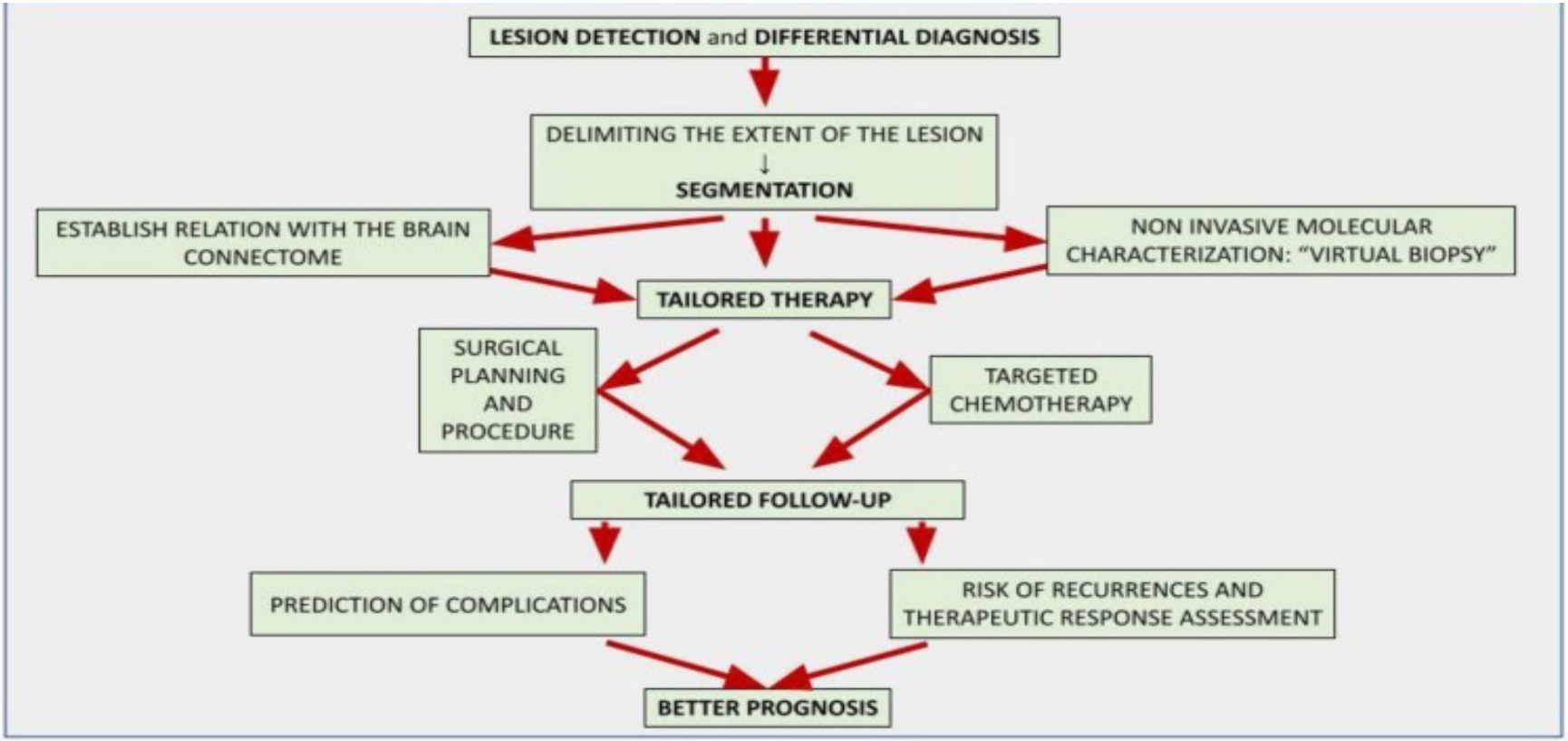
- Detection
- Prediction of outcome
- Suggestion of treatment plan

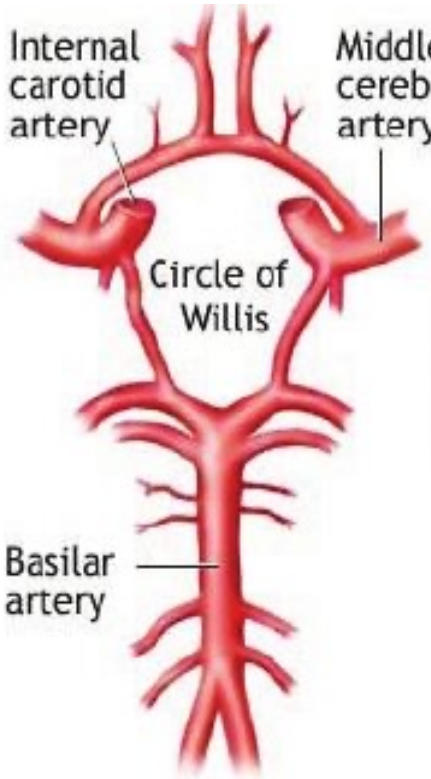
- PRIMARY TUMORS:The most common primary brain tumors are:
- Gliomas (50.4%)
- Meningiomas (20.8%)
- Pituitary adenomas (15%)
- Nerve sheath tumors (10%)

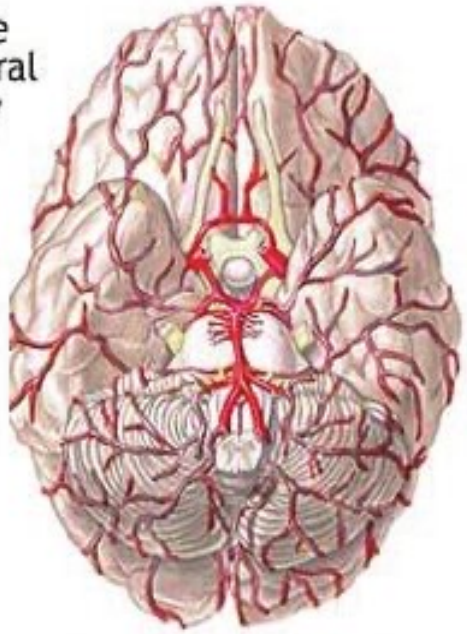
flowchart shows the possible applications of AI in brain tumor imaging to provide customized patient management



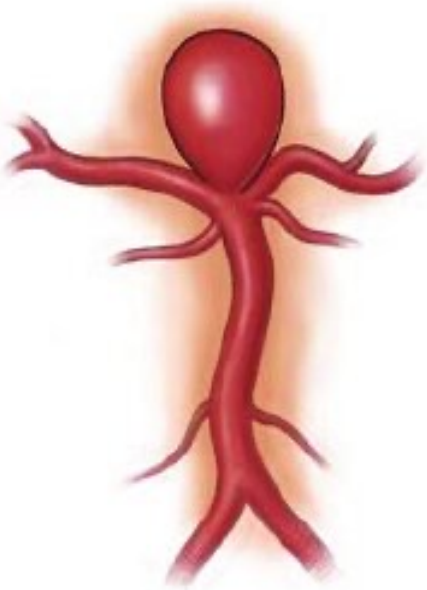
- **Intracranial aneurysms (IAs) are pathological focal dilations at walls and bifurcations of cerebral arteries. As a relatively common disease among the general population, it is estimated that the prevalence of IA worldwide is as high as 3.2 % [1].**
- **The rupture of intracranial aneurysms is the major cause of subarachnoid hemorrhage, found in about 85 % of cases, which results in high mortality and loss of productive life [1].**
- **The mortality rate of aneurysmal subarachnoid hemorrhage is**
- **23%–51%, and 10%–20% of all patients become permanently disabled, with loss of independence[2]**

- 1) Ahmed SN, Prakasam P. A systematic review on intracranial aneurysm and hemorrhage detection using machine learning and deep learning techniques. Progress in Biophysics and Molecular Biology. 2023 Jul 25.
- [2] Ueda D, Yamamoto A, Nishimori M, Shimono T, Doishita S, Shimazaki A, Katayama Y, Fukumoto S, Choppin A, Shimahara Y, Miki Y. Deep learning for MR angiography: automated detection of cerebral aneurysms. Radiology. 2019 Jan;290(1):187-94.





Bottom view of brain



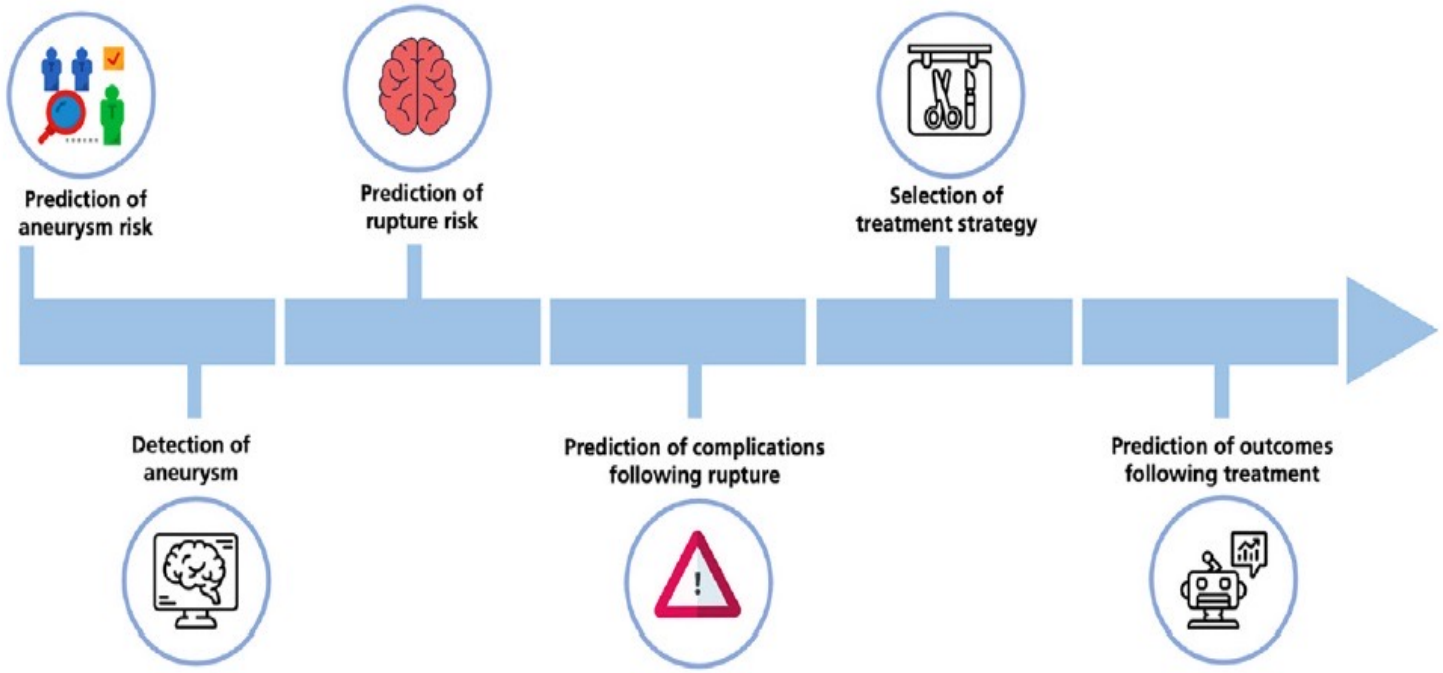


Figure 1. The potential role of deep learning in the various phases of intracranial aneurysm management.