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DISCLOSURES

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• Artificial Intelligence (AI) has the capability to boost productivity and disrupt workflows, augmenting healthcare providers in:\textsuperscript{2,5}
  • Decision-making processes;
  • Predicting patients’ outcomes;
  • Enhancing treatment efficiency.

• A greater understanding of patients’ perceptions toward AI may provide valuable insights to overcome predetermined sensible barriers toward the application of AI in Neurosurgery.\textsuperscript{1,3,4}

• By surveying two distinct cohorts of patients, we evaluated:
  • \textbf{Background knowledge} on AI and related \textbf{perceptions};
  • \textbf{Impact of education} in affecting patients’ perceptions;
  • Perceived \textbf{appropriateness} and \textbf{acceptability} rates in implementing AI platforms in neurosurgical workflows.
A two-stage cross-sectional survey was performed:

1) A qualitative survey was administered to a focused group of 20 former neurosurgical patients to investigate:
   - **Background knowledge** and **attitudes** towards AI;
   - **Change in perceptions** after information on AI;
   - **Envisaged applications** of AI in neurosurgery.

2) Using previously identified major themes, a quantitative survey was devised with five AI-based different scenarios and administered to 107 brain tumors in-patients and their relatives. 5-point Likert-scales were adopted to rate:
   - **appropriateness** of presented AI platforms;
   - **acceptability** in undergoing AI-supported surgery.

A Chi square 2x5 analysis was performed to appraise significant differences of attitudes in distinct demographical subgroups.
RESULTS – Qualitative Survey

Background knowledge on AI: Accurate 55%; Inaccurate 20%; Lacking 25%

Perceptions in undergoing AI-assisted surgery before and after information:

- Willing: 35%
- Interested: 45%
- Unwilling: 20%
- Willing: 15%
- Interested: 33%
- Unwilling: 52%

Major themes identified for the role of AI in Neurosurgery:

- Imaging interpretation: 20%
- Operative planning: 25%
- Real-time alert of complications: 50%
- Partially autonomous: 30%
- Totally autonomous: 15%
RESULTS – Quantitative Survey

Rates of participant perceptions on **appropriateness** of AI platforms supporting different phases of the neurosurgical workflow in the treatment of brain tumors.
Rates of participant **acceptability** in receiving neurosurgical treatment for brain tumors supported by the implementation of different AI platforms.

- Pre-operative interpretation of images
- Operative planning
- Real-time alert of potential complications
- Partially autonomous surgery
- Fully autonomous surgery

- Extremely comfortable
- Somewhat comfortable
- Neither comfortable nor uncomfortable
- Somewhat uncomfortable
- Extremely uncomfortable
DISCUSSION

- Overall, patients are aware of AI but have a limited understanding of its current applications in healthcare, especially in neurosurgery.

- Education on AI showed a definite impact in increasing patients’ favorability rates.

- Participants agreed Artificial Intelligence has a supportive role in brain tumor surgery, providing valuable assistance to the neurosurgeon.

- Evident resistance is reported for AI systems performing the surgery in total autonomy.

- Demographics did not show statistically significant influence in perceived appropriateness and acceptability rates.
The majority of neurooncological patients and their relatives are supportive of AI systems implemented in neurosurgery to augment their care and support the surgeon.

Notable reluctance remains for fully autonomous systems, highlighting the value patients place on maintaining human interaction in their treatment.

Patients perceptions and concerns should be used as a basis for guiding further research on AI in neurosurgery, with future AI platforms developed for decision support rather than autonomy.


