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Intra-operative neurophysiologic monitoring: Current advance and future potential

Intraoperative Neurophysiologic Monitoring (IONM) has been a very dynamic and evolving field in the last few decades, surgeries that were considered inoperable before, due to its consequences of neurological deficits, become more operable. Subtle and safe excision of many brain and spinal cord tumors became routine due to multiple advances including intraoperative neurophysiological monitoring and mapping. Surgeons' decisions become more enlightened and informed due to multimodalities that give a complete set of information about the function of the sensory, motor and even the autonomic nervous system during surgery. Vigorous wake up test during scoliosis became almost obsolete due to IONM, clipping versus coiling, shunting versus non-shunting and many other neurovascular intraoperative decisions become more informed due to the presence of that amount of information from IONM. Functional mapping can be done pre and intra operative as well, giving more confidence to surgeon with every scalpel move that he is working on the right direction, ensuring safety and integrity of the neural tracts and functions under monitoring. The future of integrating more modalities is unfolding rapidly; integrating Transcranial Doppler with EEG, SSEPs and even functional reserve testing is being developed, giving clearer picture of the dynamic changes in neurovasculature in addition to the electrophysiological changes. The development of dry electrodes and caps can give the neurophysiologist enormous channels and contacts with brain in a shorter and more efficient time during surgeries. The future of neurophysiology can change and change the future of humanity with advancing in Brain Computer Interfaces (BCIs), where the boundaries between neural cells and computer circuits slowly disappear.

Biography

Elamir Elsherif is a Neurophysiologist Physician. He has completed his MD from Ain Shams University in Cairo. He did his training in Neurophysiology in Kings County Hospital in Brooklyn, New York. He completed the American Board of Neurophysiologic Monitoring program in Chicago. Currently, he is a Consultant of Intra-operative Neuro-monitoring and the Director of Neurosonology Lab at King Fahd Medical City. He is interested in Cortical Mapping, Neuromodulation and Brain Computer Interfaces.

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