

Intraoperative Neurophysiology Monitoring for Intradural Spinal Tumours - Is it Really Useful?

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Introduction

Modern day neurosurgery requires maximum safety and use of available technology. Intraoperative neurophysiology monitoring has become invaluable adjunct to spinal surgery.

Methods

tumour.

From April 2008 to January 2016, 50 intra-dural spinal tumours were treated in our unit. All patients underwent complete pre-operative and post-operative clinical and radiological assessment. The surgeon performed thorough preoperative neurological examination. Radiological assessment was performed using pre-operative and post-operative MRI with contrast. Majority patients of the present series were discussed with neurophysiologist and operated on using intra-operative neurophysiological monitoring (when feasible) following different settings depending on the location of the



Pre-op. Plain CT (A) Axial, (B) Coronal and
(C) Sagittal and contrast enhanced T1
weigthed MRI (D) Axial and (E) Sagittal of
patient with Pseudoneoplasm



Top channel shows irritation of IX – motor (EMG) activity in palatal muscles, recorded via paired steel needles, giving warning of impending damage to this nerve

Results

Neurophysiology monitoring was used with suitable techniques depending on the location and extent of the tumours. Intraoperative stimulation of the nerve roots was used as well. Patient outcome was significantly improved with the use of intra-operative neurophysiology monitoring.

Conclusions

The use of appropriate intraoperative neurophysiology monitoring in selected cases of intradural spinal tumours increases safety of surgical excision and surgeons' confidence/ comfort during the operative procedure.

Age	Sex	Location	Pathology	Outcome	Monitoring	
65	F	C3	Meningioma**	Excellent		
76	м	D10	Meningioma*	Excellent		
43	F	L3/4	Lipoma	Fair	Yes	
67	м	C7/T1	Schwannoma	Good	Yes	
65	F	Т2	Meningioma**	Good		
60	F	T3/4	Meningioma**	Good		
54	F	D12/L1	Ependymoma*	Good		
47	F	L1/2	Ependymoma	Excellent		
42	F	C2	Meningioma	Excellent	Yes	
71	F	C5/6	Meningioma*	Good		
79	F	T4/5	Meningioma**	Good		
54	F	T10	Schwannoma	Excellent		
45	м	C4-C7	Ewing's sarcoma	Excellent		
15	м	T8-T10	Schwannoma	Good		
47	м	L2	Schwannoma	Good	Yes	
30	м	FM	Pseudoneoplasm	Excellent	Yes	
74	м	T11/L1	Schwannoma	Good		
	* Menings	ithelial, ** Psa	mmomatous, * WHO II, I	-M – Foramen Ma	gnum	
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at the beginning the use of IOM was limted due to resource limitation however as the benefits were obvious, IOM became a standard practice.

Learning Objectives

Role of intra-operative neurophysiology monitoring in intradural spinal tumours is found to be increasingly benificial and application of appropriate technique is of paramount importance.

References

1.Stecker MM. A review of intraoperative monitoring for spinal surgery. Surg Neurol Int 2012;3, Suppl S3:174-87.



Illustration of the effect that a priory probability P (I) has on the probability that a warning is associated with true injury when a warning is made with every injury (100% sensitive) and varying levels of false -positive warnings P(W/NI). W=Warning, I=Injury, NI=No Injury, P(W/NI) is a conditional probability of a warning when there is no injury