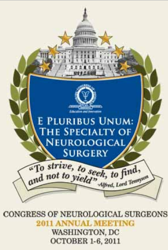

Perioperative Complications Associated with Treatment of Spinal Deformity in Patients with Movement Disorders

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Introduction

Movement disorders are frequently associated with spinal deformity. The exact influence of these conditions on perioperative complications has not been rigorously evaluated.

Methods

This is a retrospective analysis of patients treated by single surgeon (CIS) from 2003 to 2010 for spinal deformity correction with documented movement disorders.

Results

Fourteen patients underwent 23 spinal deformity correction procedures. One patient underwent four procedures, 2 underwent 2 each and 2 underwent 3 each. The average age was 67 +/- 7 years. Ten were male and 4 female. The average ASA was 3 (min 2 / max 4). The average estimated blood loss was 1741 mL +/- 1404. Sixteen of the 23 cases were revision procedures (70%). Twelve patients were diagnosed with Parkinson's disease, 1 with dystonia and 1 with essential tremor. Eleven patients were on dopaminergic therapy and three patients had deep brain stimulators placed prior to their first operation. Twelve of the patients underwent procedures for correction of thoracolumbar degenerative scoliosis and two for cervical myelopathy. The most common indication for revision was proximal junctional failure and implant complications or failure.

Complications occurred with 15/23 procedures (65%) with 36 overall. There were two mortalities (14%). The most common complications included 5 arrthymias (most commonly atrial fibrillation) and 4 venous thromboembolism (3 DVT and 1 PE). Of note thirteen complications occurred in one patient. See Table 1 for a complete list of complications.

Table 1

Patient	Movement Disorder	ASA	Procedure	Complication
1	PD	4	Same day: C3-6 corpectomies & C2-T2 PSIF	Atrial fibrillation and PEG
2	PD	4	Staged: L1-2 corpectomies, L4-5/5-1 ALIF then T10-S1 PSIF, T12-L1 SPO & L2 PSO	Atrial fibrillation
		4	T2-9 PSIF and iliac bolt placement	DVT and HITT
		4	C3-T1 extension PSIF	
		4	Revision t11-S1 rod	Atrial fibrillation, pseudogout, & delirium
3	Dystonia	3	T3-S1 PSIF with iliac bolt, Multilevel SPO	Ischemic stroke
		3	C5- T3 PSIF with T3-4 & 4-5 SPO	
4	PD	2	L3-S1 PSIF	
5	PD	3	L3-4 TLIF	Delerium and ileus
		3	Revision TLIF graft	
		3	Removal of left L3-4 instrumentation	
6	PD	2	T10–S1 PSIF& iliac bolts, L3 PSO, T12-L2 SPO	Tranfusion reaction
7	PD	3	T8 – S1 PSIF& iliac bolts, L3-4 SPO, L2 PSO	Atrial fibrillation, DVT, cholecystits
8	PD	3E	C6 Corpectomy	DVT, tracheostomy and PEG
9	PD	3	T4 –S1 PSIF and iliac bolts, T10-L3 SPO	PE
10	ET	3	T11 – S1 PSIF and iliac bolts, L2-5 SPO	Narcotic overdose
11	PD	3	T10 – S1 PSIF and iliac bolts, L3-S1 SPO	Ventricular arrthymia
12	PD	3	T11 – S1 PSIF and iliac bolts, L3 PSO	Seroma requiring bedside aspiration
		3	T2-10 extension	
		3	Same day staged L1-2/ 2-3 /3-4 ALIF and revision rod from T10 to L4	Pulmonary edema
13	PD	2	L3-S1 TLIF	
		2	Staged: T11 to S1 PSIF and L5-S1 ALIF	
14	PD	3	T3 – S1 PSIF with iliac bolts	Sepsis, septic joint, wound infection, endocarditis, mitral rejurgitation, acute renal failure, ischemic stroke, gastric perforation from PEG tube requiring exploratory laparotomy, transfusion related ARDS

PD - Parkinson's Disease, ET- Essential Tremor, ALIF - Anterior lumbar interbody fusion, TLIF - Transforaminal lumbar interbody fusion, PSIF - Posterior segmental instrumentation and fusion, SPO - Smith Peterson osteotomy, PSO - Pedicle subtraction osteotomy, DVT - Deep venous thrombosis, PE - Pulmonary embolism

Conclusions

There is a high incidence of perioperative complications related to spinal deformity correction in patients with movement disorders. They should be counseled regarding these risks preoperatively and thorough preoperative screening should be performed to mitigate their occurrence.

Future Directions

The incidence of spinal deformity in patients with movement disorders should be rigorously evaluated. Alternative methods of treating spinal deformity in this patient population should be investigated due to the high incidence of perioperative morbidity. With reports that spinal deformity associated with movement disorders may improve with drug therapy or deep brain stimulation the effect of thease treatments should be evaluated.

Learning Objectives

Improve the understanding of the incidence and type of complications occurring with spinal deformity correction and movement disorders.