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CONTENTS

BODY MASS INDEX (BMI) AS A PREDICTIVE FACTOR OF THORACIC INSUFFICIENCY SYNDROME IN ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS)

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Among the reported complications of scoliosis is restrictive lung disease. Resting metabolic rate is increased when the pulmonary function is impaired. Reduction in patients' body mass index (BMI) may be an important indicator of thoracic insufficiency syndrome. The objective of this retrospective study was to determine the correlation between spinal deformity, pulmonary function and BMI. All patients with adolescent idiopathic scoliosis (AIS) aged between 13 to 24 years, confirmed cases of AIS, and admitted at Hospital Raja Perempuan Zainab II for surgical interventions from year 2000 to 2013 were selected. Spinal deformity were determined by measuring the spinal curve angle using the Cobb angle on anterior-posterior radiographs. Pre-operative pulmonary function were evaluated using the forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV1). Pearson correlation was performed to analyse the correlation between spinal deformity and pulmonary function with BMI. Thirty-eight patients were recruited. The mean age of patients was 16.7 years (SD = 6.04). Significant positive fair correlations between BMI and pre-operative FEV1 ($p=0.009$; $r=0.417$), and FVC ($p=0.018$; $r=0.38$) were observed. However, the correlation between BMI and Cobb angle was not significant ($p=0.363$). In conclusion, BMI was affected by poor lung function in AIS patients and can be used as a predictive factor of thoracic insufficiency syndrome.

LUMBAR FUSION SURGERY – IMPROVEMENTS IN SURGICAL TECHNIQUES TO MINIMISE THE INVASIVENESS

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BACKGROUND / OBJECTIVES

Lumbar fusion surgery has previously been associated with long skin incisions, significant pain post-operatively and associated morbidity. MIS Surgery can lessen some of the morbidity. In some spine cases, tubular retractors can be used, but in certain cases such as lumbar spine tumors, they cannot be used. Other improvements in surgical techniques can decrease the invasiveness of surgery eg: Usage of microscopes/microsurgical techniques, Spine Navigation, and these can improve patient outcomes.

METHODS

This study is a retrospective series by a single spine neurosurgeon in Singapore General Hospital. There were a total of 23 patients. The indications for lumbar fusion included: Degenerative Spine disease(8)(eg.TLIFs) and Spine Tumors(15 cases) (Benign and malignant). The duration of the study was from 2009 to 2013. Improved techniques such as Spine Navigation were used. The author also used laminotomy(at the end of surgery-replacing the lamina which was still attached to the supraspinous ligaments at 1 end), instead of laminectomy in tumor cases.

RESULTS

The overall results were good. All patients had preservation or gradual improvement of neurological lower limb power. There were no cases of pedicle screw related neural damage, and all patients(100%) achieved fusion. Patients were mobilized soon after surgery, and were discharged from hospital. Only 1 patient had an inadvertent dural tear intra-operatively, and this was repaired successfully. Two patient had wound infections, and these were treated successfully with drainage and antibiotics.

In conclusion, for lumbar fusion surgery, improvements in surgical techniques such as spine navigation, microsurgical techniques, and the usage of laminotomy have improved the surgical outcome.

APICAL VERTEBRAE VS LUNG FUNCTION IN ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS)

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A retrospective record review was conducted among patients with adolescent idiopathic scoliosis (AIS) aged 13 to 24 years, admitted to our institution for surgical intervention from 2000 to 2013. A total of 38 patients were studied to determine apical vertebrae location and lung function. The curvature of spinal deformity was measured by Cobb method on anterior-posterior radiographs. The forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV 1) were used to evaluate their pre operative pulmonary function. Simple linear regression was performed to analyse the relationship between Cobb angle and pre operative pulmonary function. Kruskal-Wallis and Mann Whitney tests were used to compare the lung function according to the severity of the deformity and different levels of affected spinal vertebra. A total of 38 patients were studied that involved thoracic and thoracolumbar scoliosis. The median FVC was significantly higher in those with affected apical vertebrae located at L1, L2 and L3 levels (median =92; IQR= 30) than those with apical vertebra at T6, T7 and T8 (median =68.5; IQR= 36) (p=0.008). The median FVC was also significantly higher in those with affected apical vertebra located at L1, L2 and L3 (median =92; IQR =30) than those with affected T9-T12 (median =74; IQR= 19 (p=0.003). In conclusion, impairment of lung function was seen in more severe spinal deformity and more proximally located curve.