MRI Imaging and CT Multi-Slice: Assessment of a patient with Congenital Spinal Deformity

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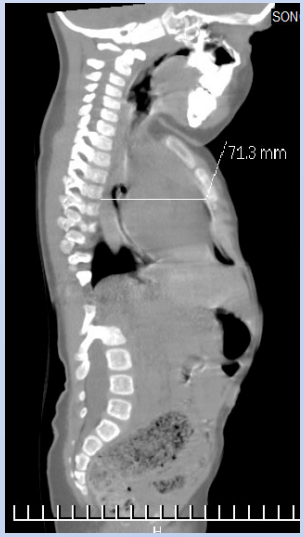
Introduction

It is difficult to perform an accurate assessment of infantile patients with congenital scoliotic deformities.

If the scoliosis is progressive early surgical treatment is required.

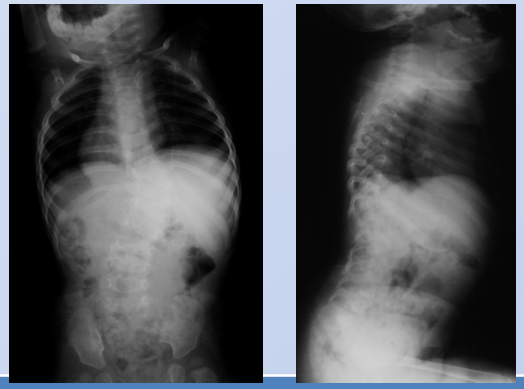
In addition to pathologies of the vertebral colon, lung capacity, diaphragm function, intraspinal cord and abdominal and/or cardiovascular anomalies need to be assessed prior to treatment.

Background



In this study we evaluated the effectiveness of the combined analysis of MRI Imaging and CT multi-slice technology in the assessment an infantile patient with a congenital spinal deformity prior to surgical treatment.

Methods

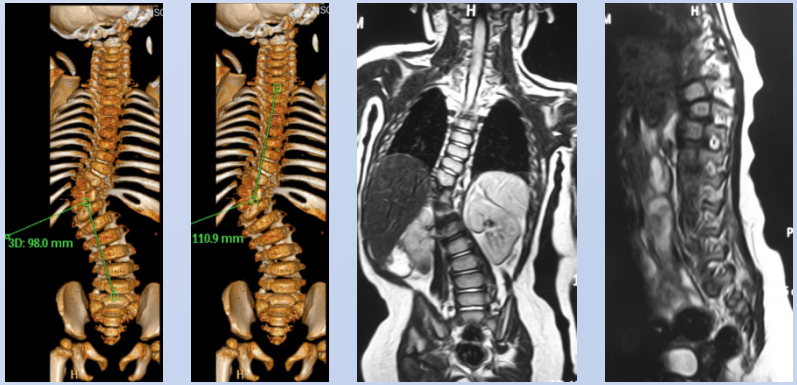


A two year old female patient diagnosed with congenital scoliotic deformity was evaluated using MRI Imaging and 3D CT multi-slice technology.

Lung volume and shape - height, width, weight and depth - were evaluated with CT multi-slice,

As well as diaphragm shape, introthoracic volume and introabdominal volume, height, width weight and depth.

Methods



Vertebral colon anomalies, intraspinal pathologies and other organ anomalies were evaluated.

Vertebral colon height was also measured.

Results

3D CT multi-slice imaging revealed

- A total lung volume of 687.4 cc (Right lung 362 cc, left lung 305.3cc).
- Thoracic vertebral height was 110.9mm.
- Lumbar height was 98mm.
- Introrabdominal height was 161.7mm, depth 81.6mm, width 147.6mm.
- Introthoracic height was 87.3mm, depth 73.2mm, width 135.5mm.
- Introabdominal volume was 1465.9cc.
- Diaphragm width 151.3mm.

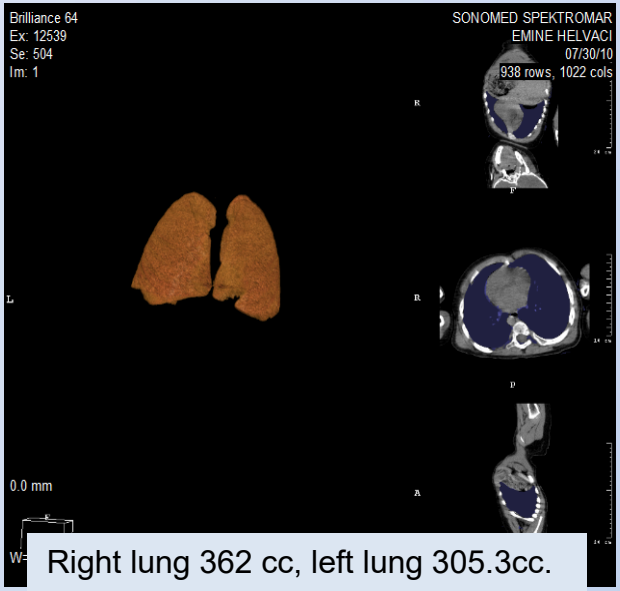
Results

Rib fusion and hemivetebral anomalies on the of the thoracolumbar junction.

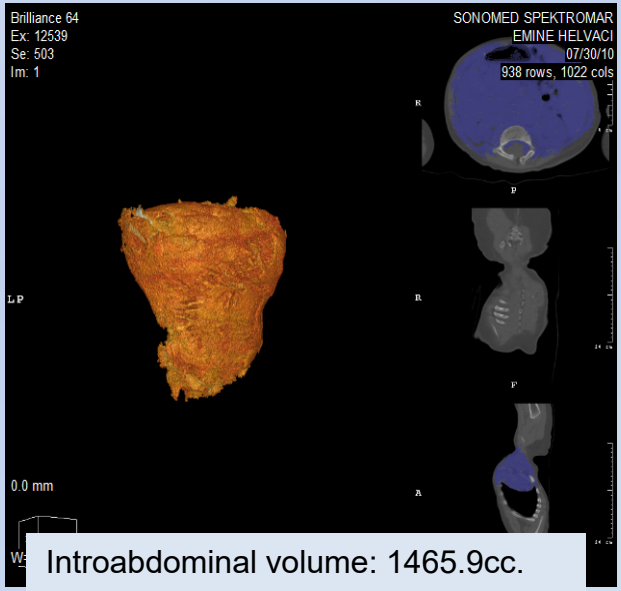
MRI results showed

- T10, T11, T12 Butterfly (Hemivertebra),
- Tetherd Cord anomalies,
- Diastomatomyelia and
- Lumbar spina bifida anomalies.

Results



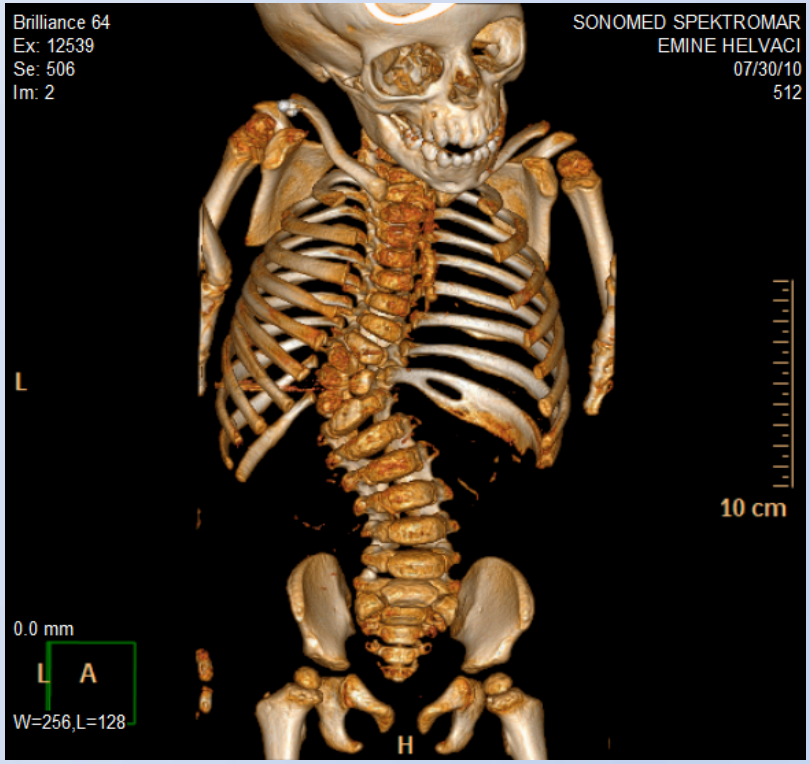
Right lung 362 cc, left lung 305.3cc.



Introabdominal volume: 1465.9cc.

MRI Imaging and CT Multi-Slice	
3D CT multi-slice imaging	Total lung volume of 687.4 cc (Right lung 362 cc, left lung 305.3cc). Introabdominal volume was 1465.9cc. Thoracic vertebral height was 110.9mm. Lumbar height was 98mm. Introrabdominal height was 161.7mm, depth 81.6mm, width 147.6mm. Introthoracic height was 87.3mm,depth 73.2mm, width 135.5mm. Diaphragm width 151.3mm
MRI results	T10, T11, T12 Butterfly (Hemivertebra), Tetherd Cord anomalies, Diastomatomyelia and lumbar spina bifida anomalies.

Results



Thoracic vertebral height:110.9mm.
Lumbar height: 98mm.
Introrabdominal height:161.7mm,
depth:81.6mm, width:147.6mm.
Introthoracic height :87.3mm,depth:73.2mm,
width:135.5mm.
Diaphragm width:151.3mm

Total lung volume of 687.4 cc

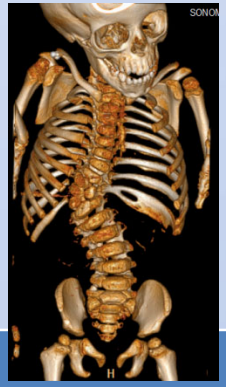
Conclusions

Lung volume changes during inspiration and expiration.

It is difficult to ascertain an accurate lung capacity for infantile patients.

Chest wall deformity, diaphragm shape and lung function and lung capacity need to be closely examined and evaluated before undertaking spinal surgery.

Conclusions



Recent studies concerning EOS patients discuss CT methods.

Although our study did not examine the difference in lung capacity for inspiration and expiration it nevertheless gave us vital information to help us assess future treatment.