

REVISION STRATEGIES IN CASE SURGICALLY TREATED BEFORE THE AGE OF 9



G BOLLINI MARSEILLE

DISCLOSURE

Consultant:

Medtronic

Synthes



Collection P. Roussouly

2 Y of age

8 Y of age



16 Y of age Collection P. Roussouly





2 Y of age

16 Y of age Collection P. Roussouly























Removal of the upper part of the rod

Collection P. Roussouly





22Y of age Died from respiratory failure



Collection P. Roussouly

We must take into consideration

Tri dimensional deformity;

AP and Lateral full spine XRays in a standing position (EOS)





Convexe posterior thoracic epiphyseodesis at 2 years of age for an HV Result at 14 years of age

We must take into consideration

Tri dimensional deformity;

CT scan with bi and tri dimensional reconstruction





We must take into consideration

Position and state of the neurological elements (medulla, nerve roots) MRI of the entire spine Arteriography of the medulla ? Pre op. monitoring of the spinal cord (SSEP, NMEP)









LONG LASTING PROCEDURES

BLOOD LOSS

Cell Saver Carefull positioning of the patient Avoid excessive pressure points (eyes, axilla) Allow the abdomen to hang free Antifibrinolytics such as Aprotinin are no longer administered Blood transfusion

AVOID LOW CARDIAC OUTPUT which is at risk for the spinal cord

MONITORING OF THE CORD IS MANDATORY (SSEP, NMEP)

DUE TO PREVIOUS SURGERIES

LAMINECTOMY(IES)..... Carefull approach

IMPLANTS REMOVAL head of the screws can be deteriorate

FIBROUS BANDSas strong as the bone itself, to be removed

FUSIONosteotomy(ies) often mandatory

Which kind of approach

Anterior ?

Posterior ?

Both (same procedure or separate procedures)?

Additional procedures Halo gravity ? Halo Brace ? After disc or previous anterior fusion release ?





SURGICAL TECHNIQUES





SMITH PETERSEN

PONTE or OSTEOTOMIES

Pedicule screws are inserted for the appropriate levels which are to be included in the definitive instrumentation and fusion

L. Lenke

THESE OSTEOTOMIES ARE PERFORMED AT THE APEX OF THE DEFORMITY

These osteotomies are helpfull to aid in safe apical pedicle screws by allowing medial palpation of the pedicle

These osteotmies are to be avoided is there is an angular kyphotic deformity as this can produce ventral settling of the tight spinal cord until a temporary rod is in place spanning the angular deformity





PEDICLE SCREWS

MULTIAXIAL PEDICLE SCREWS



Apical concave regions of severe scoliosis

Proximal and/or distal regions of severe kyphosis or kyphoscoliosis

Concave lumbar regions of any type of deformity in the lumbar spine

To avoid thoracic nerve roots injuries by ligation medial to the dorsal root ganglion Lenke recommend placing temporary vascular clamps on the root sleeve for 5 to 10' while checking the spinal cord monitoring to make certain no changes in the potentials are seen before ligation



In the thoracic spine;

Bilateral costotransversectomy of 5 to 6cm of the medial ribs associated with the resection level (1, 2 or 3 levels)

The vertebral body resection begins by gaining access to the cancellous bone of the vertebral body trough a lateral pedicle-body entrance The entire body is removed except for an anterior shell

Next, discectomies both above and below the corporectomy are performed using curettes





















PU





DURA MATER

Peroneal Graft







NEW FUSION AREA

Different from adding on

POSTERIOR APPROACH

LEFT T12 L1 SEMISEGMENTED H.V. (FUSION T12) Additional Kyphotic condition



1 Month





1 Y 10 M



2 Y 10 M







6 Y 8 M







1 M of age













3Y of age

СО

Collection P. Roussouly

















EXTENDING FUSION AREA

adding on

ANTERIOR + POSTERIOR APPROACH











AR





AR

SAME SITE SURGERY FOR « INAPPROPRIATE » PREVIOUS SURGERY

Patient sent to our institution with an history of HV excision

POSTERIOR APPROACH + ADDING ON







GR



GR

Imperforate anus Right kidney agenesis 70° Cobb angle















1 Y 4 M

HV hemicircumferential exeresis. Fusion with rib

Post op. Cobb angle = 37°



13 Y of age Rib Hump = 3cm Cobb angle = 60°





16 Y of age Rib Hump 35mm Cobb angle 60°







1 Y 10 M



Pre Op Post Op 1 Y 10 M

7 Y 3У







Collection P. Roussouly





8 Y of age



Collection P. Roussouly





11Y of age



SAME SITE SURGERY FOR «INAPPROPRIATE» PREVIOUS SURGERY

NF1 Patient sent to our institution with an history of anterior thoracic fusion for thoracic lordosis

ANTERIOR + POSTERIOR APPROACH + ADDING ON

N.F.1 5 years of age : seizure + coma Increased blood pressure due to a renal artery stenosis Complete neurologic recovery Brain M.R.I. : normal Spine : thoracic lordosis





5 years of age





Five levels anterior thoracic arthrodesis

6 years of age











5 Y

6 Y

8 Y

11 Y

15 Y

NA













ANTERIOR AND LATERAL MENINGOCELE













1.11.1985



8.11.1985


6.12.1985 14 Y 1 M

Collection D. Chopin



19.5.1987



23.5.1990







3.9.2003

Collection D. Chopin





27.2.2008 36A 3M

Collection D. Chopin

Hypomobility of the Rt upper and lower Limb noticed by the parents after birth

Hydrocephalia, Macrocephalia

Walking age : 19 M

SSEP Normal upper limb amplitude and latency period Low amplitude lower limbs with normal latency Conduction time in the brain stem is discretely lengthy







2 Y 8 M





2 Y 11 M



3 Y 8 M





Neurologic P/E:

Hyperreflexia in the lower extremity

Normal reflexes in the upper extremity

Head circumference : 54.5 cm

Papillary edema

6 Y 3 M

Hardware Removal + Orthosis





6 Y 3 M





6 Y 5 M



ysiodesis and a It arthrodesis



7 Y 4 M

Respiratory Status 2007

Chronic restrictive respiratory insufficiency VC: 27 % Hypercapnia: 45mmhg Capacity to walk :150m and stair climbing :10 -15 steps Thoracic cage pain Frequent nocturnal awakening Annual prophylactic vaccination to prevent pulmonary infection

Echocardiography 2007:

Lt Ventricle: normal Pressure in the Rt Ventricle is increased Removal of the costal distraction devices due to junctional kyphosis and ineffectivity of them in correcting the kyphosis and also a significant painful shoulder syndrome





8 Y

Gastrostomy for hyperalimentation

Halo traction & Tracheostomy





10 Y





DON'T LOSE CONTROL OF THE SPINE

