Abramson/Reverse Nuss Operation for Carinatum

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My Country
Disclosure

I have nothing to declare…

Pectus carinatum (PC) is a common congenital chest wall deformity

Conventional tech. for the repair of PC is Ravitch sternoplasty & modifications

Minimally invasive technique for PC:
Abramson procedure (MIRPC)
MIRPC (Abramson Procedure)

- Minimally invasive technique (modified Nuss procedure)
- No need for thoracoscopic guidance
- Implanting a presternal metal bar
- Cosmetic results are satisfying

Follow-up for MIRPC

- Like Nuss Procedure
- Bar kept in position for 2 years
- The ideal age range: 14 – 18 yo
Preoperative compression test to see if MIRPC is suitable also used as an exercise to increase the chest wall flexibility.
PRESSURE ANALYSIS

Treatment of choice;

Orthosis \( p < 10\text{kg} \)

MIRPC \( p10-25\text{kg} \)

Open surgery \( p > 25\text{kg} \)

Current Treatments

Orthotic  
Surgical
Different types of orthesis ...

Preoperative Evaluation

PA and Lat chest X-ray
Pulmonary function tests
Total blood count
Skin test for nickel allergy
Anesthesia consultation
Preop. education
Optional Studies

CT Scan (complex cases)
Echocardiogram (Cardiac path.)
Consult. For concomitant prob.
  
  Marphan - Genetic
  Kyphosis - Orthopedics

Contra-indications

Chest rigidity ( p > 25 kg )
Chondro-manubrial deformity
Some complex malformations
Under 14 years old
Surgical Treatment

*It is as easy as it seems but complicated!!!*

Check the bars and instruments
Identify target points
Measure the chest wall
Designate the bar size
Identify the highest point and incision lines
Shape template & bar
Correct the PC
**Postoperative**

- No chest tube
- IV PCA
- IV antibiotics
- Directly to the ward
- Nasal O2
- Chest X-Ray
- Early mobilization

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**Postop First Month**

- Oral analgesics
- Semi-fowler position even during sleeping
- Resume normal activities gradually
- No sports at all
- Control at the end of first month
After First Month
Patients should be off analgesics
Walking - only

After Three Month
Not heavy lifting at all
Swimming, soccer, basketball

The treatment of choice in PC:
- Short operating time
- Low morbidity
- Good results
My Experience on Pectus Carinatum

Open surgery before 2006

MIRPC since January 2006

We created and developed 5 times our own bar and stabilizing system

Turkish Patent Institute – Utility Model Certificate
My Experience on MIRPC
(Abramson Procedure)

January 2006 – April 2016
179 patient (162 m/ 17 f – mean 17.25yo)

- 86 asymmetric (15 mix.)
- 93 symmetric  (1 mix.)

- Median operation duration was 75 minutes
- Median hospital stay - 3,72 days (range: 2-10)
- Satisfactory with 95 % in ‘questionnaire’
- 16 Mixed Deformities - Sandwich Technique
Surgical Treatment
Learning Curve
at least 20 cases !!!

In first couple of cases, it is better to work with an expert surgeon.

Our Learning Curve
Brachial Plexus Injury
Case 1

Cutaneus Adhesion
Case 4 & 9
Over-correction
Case 5

Steel Wire Breakage
Case 8
Overall Perop & Early Postop Complications

Bar dislocation from the stabilizer
Broken steel wire
Pneumothorax

Overall Late Complications

Brachial Plexus Injury 1
Metal Allergy 2
Rib Cut 2
Insufficient Correction 2
Granulation 2
Cutaneous Adherence 2
Hiperpigmentation 3
Overcorrection
Steel wire breakage 7
Wound Infection 9

Cases
COMPLICATION MANAGEMENT

Broken Steelwire

Chest Wall International Group (CWIG) Meeting
CHRD Annual Advanced Pectus Course
COMPLICATION MANAGEMENT

We started to use Sternal Cable

Over - Correction

Chest Wall International Group (CWIG) Meeting
CHKD Annual Advanced Pectus Course
COMPLICATION MANAGEMENT

“Sandwich Technique”

Insufficient Correction

Chest Wall International Group (CWIG) Meeting
CHKD Annual Advanced Pectus Course
COMPLICATION MANAGEMENT

Bar path
1cm above the highest point

Bar Dislocation
COMPLICATION MANAGEMENT

Changed bar and stabilizer

Rib Cut

Optimal Cable Tension (not so tight)
Hyperpigmentation

COMPLICATION MANAGEMENT

Dermatology Consultation
**Cutaneus Adhesion**

1- Use longer bar
2- Insert the bar under the muscle

**COMPLICATION MANAGEMENT**

1- Use longer bar
2- Insert the bar under the muscle
Nickel Allergy

COMPLICATION MANAGEMENT

Skin Test
(History of Allergy)
Challenging Cases

The Nuss Procedure for Pectus Excavatum: Evolution of Techniques and Early Results on 322 Patients
Hyung Joo Park, MD, Seock Yeol Lee, MD, Cheol Sae Lee, MD, Wook Youm, MD, and Kihl Roh Lee, MD
Department of TH n, South Korea
Asymmetric Deformities

We can successfully operate asymmetric cases by minimally invasive technique

but

It is important to define type of deformity & designate the proper operation type
What we have done so far ...

16 cases (%2)

Sandwich Operation

These patients are;
neither PE nor PC (Mixed Deformity)
Asymmetric
17 yo - Male
Postop 5th Days

Chest Wall International Group (CWIG) Meeting
CHKD Annual Advanced Pectus Course

Mixed Deformity

Preop
21 yo Male
Postop 7th day
Mixed Deformity

17 yo, F

Mixed Deformity

18yo- Male

Preop

Postop 1ST month
Mixed Deformity

Preop 25 yo - Male

Postop 1ST Month

Mixed Deformity

Preop 15 yo - Male

Postop 1ST Week
We can operate “Mixed Deformities” by minimally invasive technique, we have to pay attention to define deformity and designate proper operation type.

THANK YOU FOR YOUR ATTENTION