

Complications in the treatment of a missed Monteggia fracture

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ULB

09/2013

4-year-old boy
Fall on the left forearm



1 week later



6 weeks post-trauma

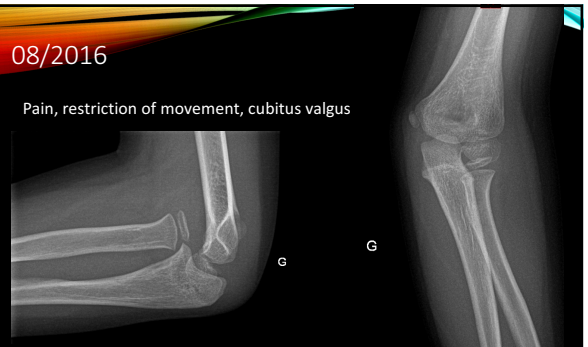


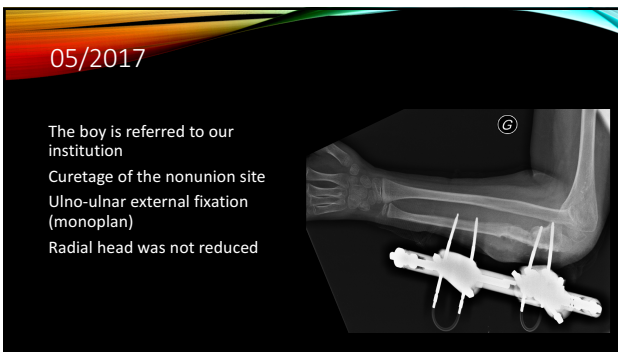
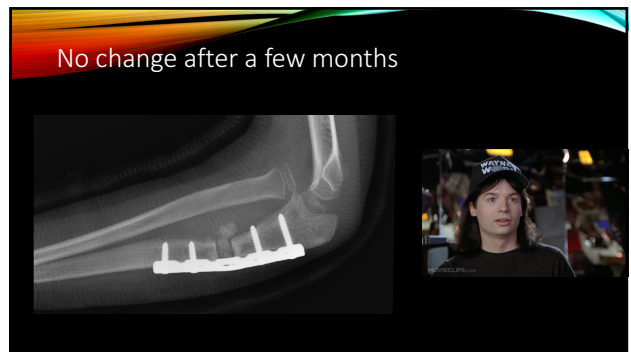
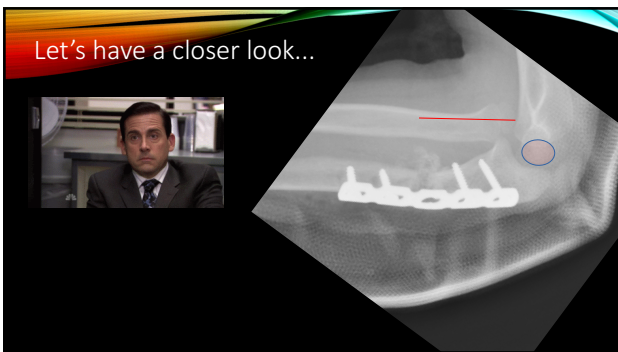
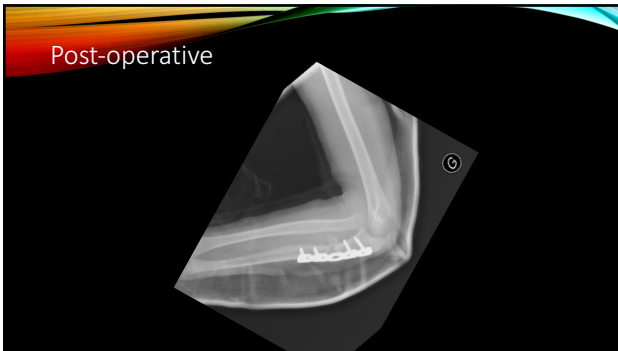
6 weeks post-trauma



08/2016

Pain, restriction of movement, cubitus valgus





Modification of the position of the ExFix

20 mm of lengthening

Correction of the hyperextension & correction of the varus

Closed reduction of the radial head was not possible

07/2017

Open reduction of the radial head

Stabilization with the ExFix

08/2017

Ablation of the radial part of the external fixator

09/2018 (one year later)

Ablation of the external fixator

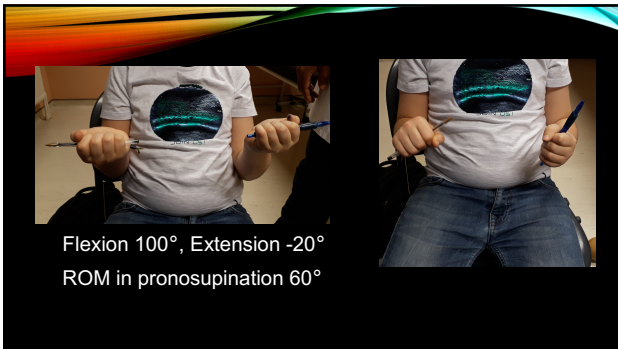
12/2018 : back to surgery

Curettage of nonunion

Iliac crest graft

Osteosynthesis with a plate

03/2019



Epidemiology

Monteggia fracture in children: only 1 % of the forearm fractures
Missed Monteggia: 16-33 %

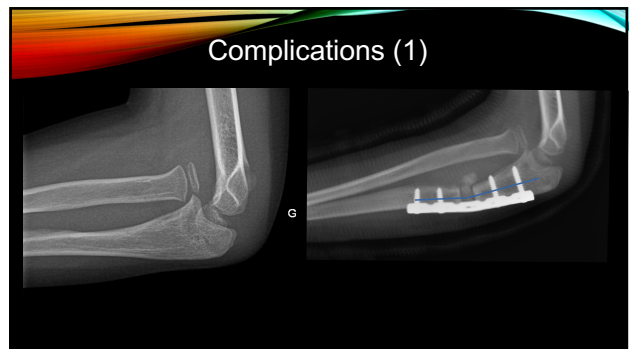
Ring et al. Monteggia fractures in children and adults. 1998
Babb et al. Monteggia fractures : beware. 2005

Controversies

Why does it need treatment ?

- Valgus deformity
- Limitation of ROM
- Elbow instability
- Ulnar nerve palsy

Kim et al. Chronic radial head dislocation in children, part 1 : pathologic changes preventing stable reduction and surgical correction. 2002
Papanicolaou et al. Posttraumatic reconstruction of the elbow in the pediatric patient. 2000
Rodgers et al. Chronic Monteggia lesions in children. Complications and results of reconstruction. 1996



Complications (2)

Exner described the closed reduction after progressive lengthening and bending of the ulna

Not always possible (soft tissue interposition) → open reduction quite frequent in all techniques

Exner et al. Missed chronic anterior Monteggia lesion : closed reduction by gradual lengthening and angulation of the ulna. 2001
Stragler et al. Long-term follow-up of corrective ulnar osteotomy for missed Monteggia fractures in children. 2018
Hasler et al. Open reduction, ulnar osteotomy and external fixation for chronic anterior dislocation of the head of the radius. 2005
Lu et al. Management of missed Monteggia fractures with ulnar osteotomy, open reduction, and dual-socket external fixation. 2013

Complications

Use of external fixator:

Pros: progressive and adjustable correction, less invasive than plating

Cons: pin infection, multiple interventions under general anesthesia

Exner et al. Missed chronic anterior Monteggia lesion : closed reduction by gradual lengthening and angulation of the ulna. 2001
Take et al. Ulnar osteotomy and the Iliizarov mini-fixator for pediatric chronic Monteggia fracture-dislocations
Di Gennaro et al. Outcomes after surgical treatment of missed Monteggia fractures in children. 2015
Hasler et al. Open reduction, ulnar osteotomy and external fixation for chronic anterior dislocation of the head of the radius. 2005
Lu et al. Management of missed Monteggia fractures with ulnar osteotomy, open reduction, and dual-socket external fixation. 2013


Complications

No study compares external fixation and plating

Is nonunion more frequent with external fixation ? It depends on the **acute** lengthening

Di Gennaro et al. 3/10 (when acute lengthening is more than 7 mm)

Recommended to graft ulnar osteotomy if lengthening is more than 1cm



Di Gennaro et al. Outcomes after surgical treatment of missed Monteggia fractures in children. 2015

Hasler et al. Open reduction, ulnar osteotomy and external fixation for chronic anterior dislocation of the head of the radius. 2005

Wang et al. External fixator-assisted ulnar osteotomy: a novel technique to treat missed Monteggia fracture in children. 2019

Lu et al. Management of missed Monteggia fractures with ulnar osteotomy, open reduction, and dual-socket external fixation. 2013




A 6-year story... Is it finally over?

Long-term outcomes

- Subluxation or redislocation (most common complication, 13-54%)
- Osteoarthritic changes
- Diminution of ROM (especially pronation)
- Radioulnar synostosis (especially after ligament reconstruction)

Nakamura et al. Long-term clinical and radiographic outcomes after open reduction for missed Monteggia fracture-dislocations in children 2009

Rahbek et al. Long-term outcome after ulnar osteotomy for missed Monteggia fracture dislocation in children. 2011

Stragier et al. Long-term follow-up of corrective ulnar osteotomy for missed Monteggia fractures in children. 2018

Long-term outcomes

Two important factors:

- Age at the time of surgery
- Interval between the fracture and the surgery

No statistical evidence in the literature

Limit of good results: 10-12 years old at time of surgery, less than 3-6 years between Monteggia and surgery

Nakamura et al. Long-term clinical and radiographic outcomes after open reduction for missed Monteggia fracture-dislocations in children 2009

Hirayama et al. Operation for chronic dislocation of the radial head in children. Reduction by osteotomy of the ulna. 1987

Wang et al. Chronic posttraumatic anterior dislocation of the radial head in children: thirteen cases treated by open reduction, ulnar osteotomy, and annular ligament reconstruction through a Boyd incision. 2009


Stoll et al. Treatment of the missed Monteggia fracture in the child. 1992

Take-home messages

Just... don't miss it

Treat it as soon as you see it, even if asymptomatic

(Auto)graft the osteotomy site if acute lengthening of more than 7-10 mm to avoid nonunion



NO

