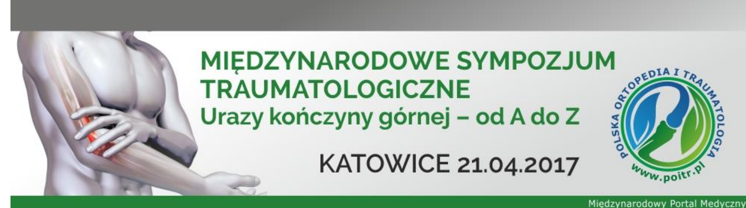
Robert Wilk, Damian Kusz



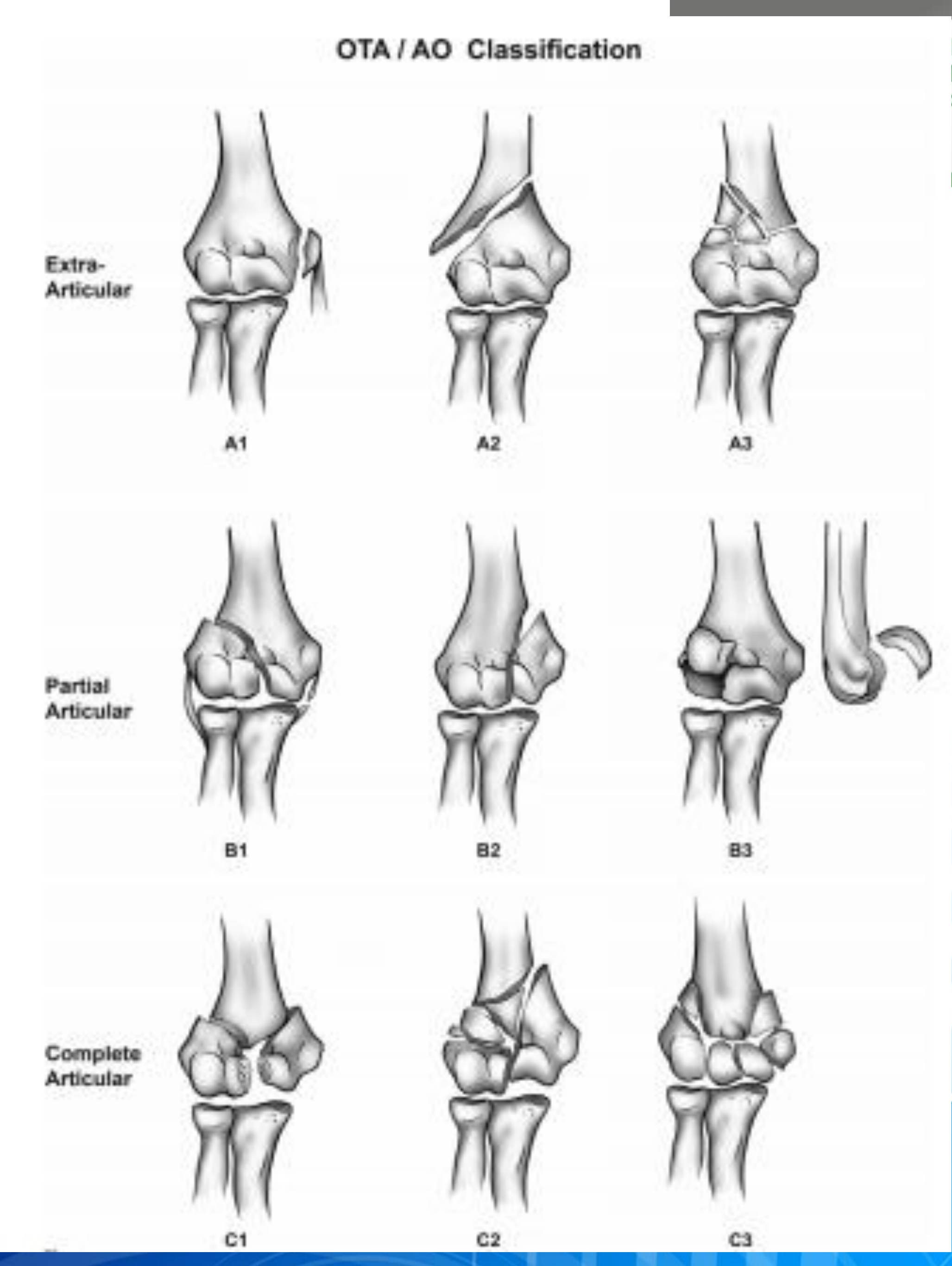
Złamania okolicy łokcia - kiedy i kogo operować?

Fractures of the elbow –
when and whom should we operate?

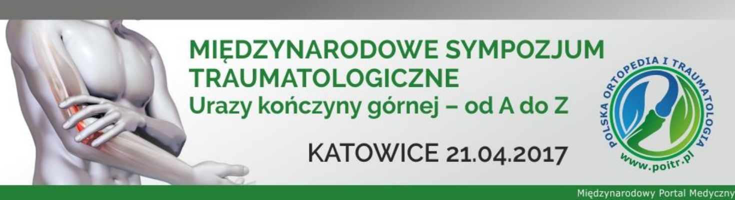
Katedra i Klinika Ortopedii
i Traumatologii Narządu Ruchu SUM

Department of Orthopaedics and Traumatology
Medical University of Silesia

fppt.com


OTA / AO Classification
Extra-
Articular
A1
A2
A3
Partial
Articular
B1
B2
B3
Complete
Articular
C1
C2
C3

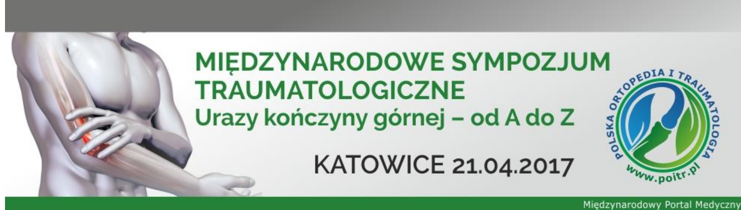
Clinical Assessment



The clinical evaluation should include careful assessment of the ipsilateral shoulder and wrist, and a detailed neurovascular examination (The prevalence of preoperative ulnar nerve symptoms in patients with a type-C fracture of the distal part of the humerus has been reported to be 24.8%)

fppt.com

Radiography



Anteroposterior and lateral radiographs of the distal part of the humerus and computed tomography (CT) scanning with three-dimensional reconstructions In the setting of articular comminution should be obtained.

fppt.com

- The principles of treatment include anatomic articular reduction and rigid fixation with two strong plates (highly rigid and 3.5 mm at a minimum).

- the risk of a poor outcome with the use of Kirschner wires or screws was almost three times higher than the risk with plate fixation.

Copyright © 2011 by The Journal of Bone and Joint Surgery, Incorporated

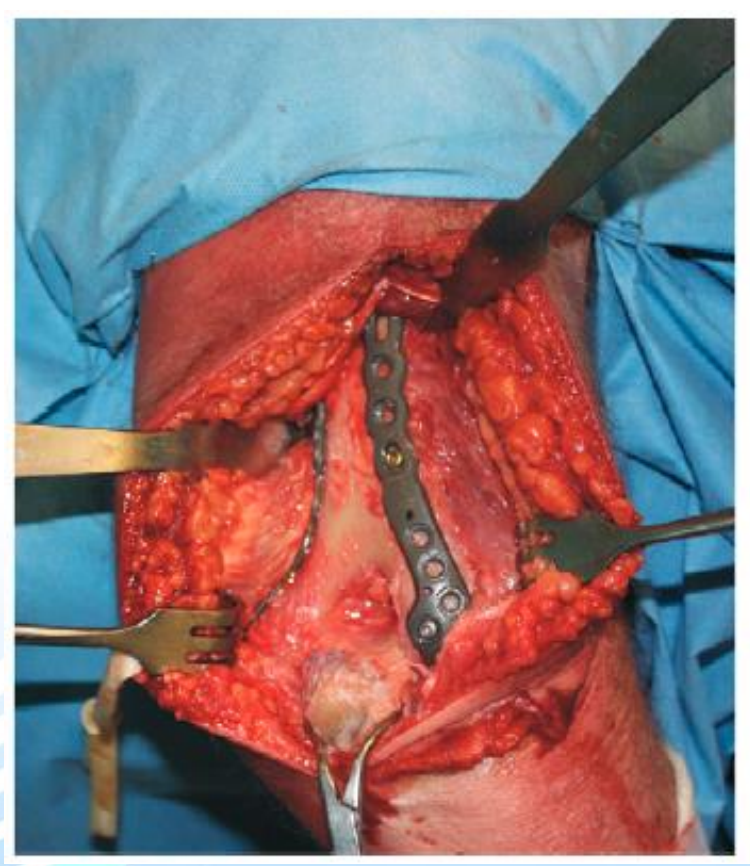
Current Concepts Review

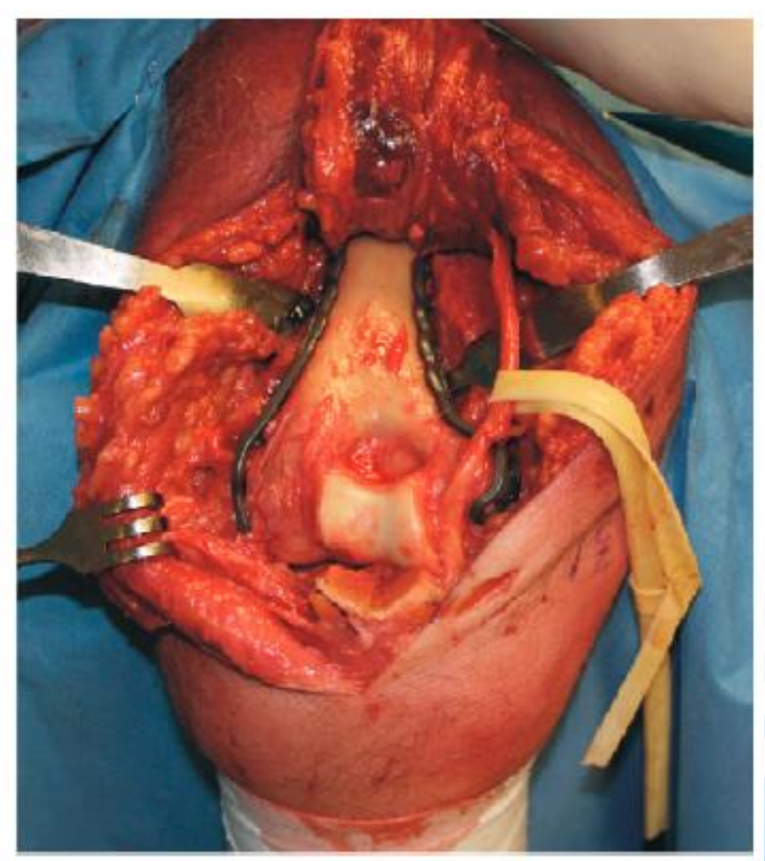
Distal Humeral Fractures in Adults

By Aaron Nauth, MD, FRCSC, Michael D. McKee, MD, FRCSC, Bill Ristevski, MD, FRCSC, Jeremy Hall, MD, FRCSC, and Emil H. Schemitsch, MD, FRCSC

fppt.com

90 or 180 degrees ??





Biomechanical study have demonstrated that parallel plate configurations with the plates at 180 to each other are biomechanically superior to perpendicular plates

fppt.com

Nonoperative Treatment

MIĘDZYNARODOWE SYMPOZJUM TRAUMATOLOGICZNE
Urazy kończyny górnej – od A do Z
KATOWICE 21.04.2017

Nonoperative management is reserved for completely undisplaced fractures, patients who are unable to tolerate anesthesia, and those with advanced dementia.

This typically involves immobilization of the elbow in 60 of flexion for two to three weeks, followed by gentle range-of-motion exercises.

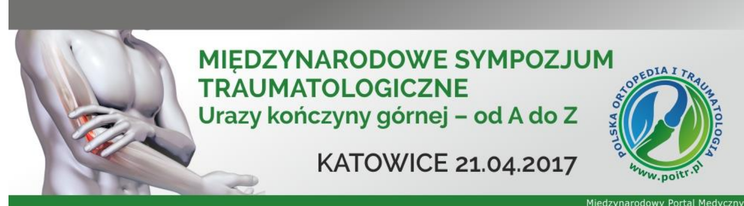
COPYRIGHT © 2011 BY THE JOURNAL OF BONE AND JOINT SURGERY, INCORPORATED

CURRENT CONCEPTS REVIEW
Distal Humeral Fractures in Adults

By Aaron Nauth, MD, FRCSC, Michael D. McKee, MD, FRCSC, Bill Ristevski, MD, FRCSC, Jeremy Hall, MD, FRCSC, and Emil H. Schemitsch, MD, FRCSC

fppt.com

Bag of bone



- Patients were treated in an above-elbow plaster splint, but had this changed to a simple sling within 14 days of injury. Patients were not referred for physiotherapy, but were encouraged to use and move the elbow as discomfort allowed.
- 95% reported a functional range of elbow flexion (4 months of follow-up). The cumulative rate of fracture union at one year was 53%

■ TRAUMA

Revisiting the 'bag of bones'

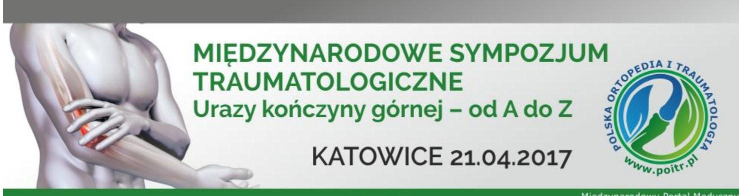
FUNCTIONAL OUTCOME AFTER THE CONSERVATIVE MANAGEMENT OF A FRACTURE OF THE DISTAL HUMERUS

S. A. Aitken,
P. J. Jenkins,
L. Rymaszewski

From Glasgow Royal Infirmary, Glasgow, United Kingdom

fppt.com

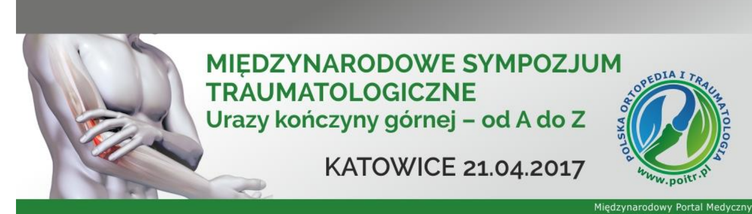
Why not ??



A

B

fppt.com



DHH is most typically used for intraarticular fractures of the distal humerus in older patients. DHH offers preservation of bone stock without the postoperative restrictions required by TEA

HAND (2014) 9:406–412
DOI 10.1007/s11552-014-9681-3

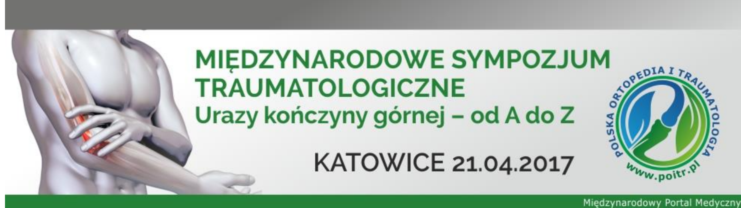
REVIEW

Distal humeral hemiarthroplasty: indications, results, and complications. A systematic review

John Dunn · Nicholas Kusnezov · Miguel Pirela-Cruz

fppt.com

TEA or ORIF ??



- TEA and ORIF lead to comparable functional results, but major complications are more common after ORIF. Despite this, ORIF remains the gold standard for younger and older patients because of the lifelong loading limitation after TEA, unknown implant survival and problematic revision surgery.

International Orthopaedics (SICOT) (2015) 39:747–754
DOI 10.1007/s00264-014-2635-0

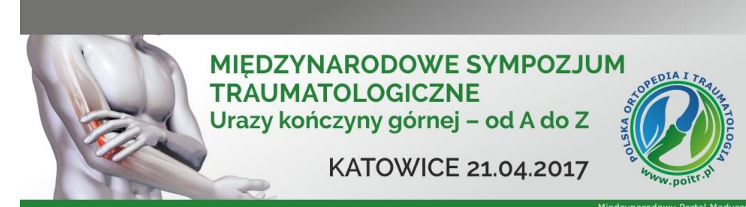
ORIGINAL PAPER

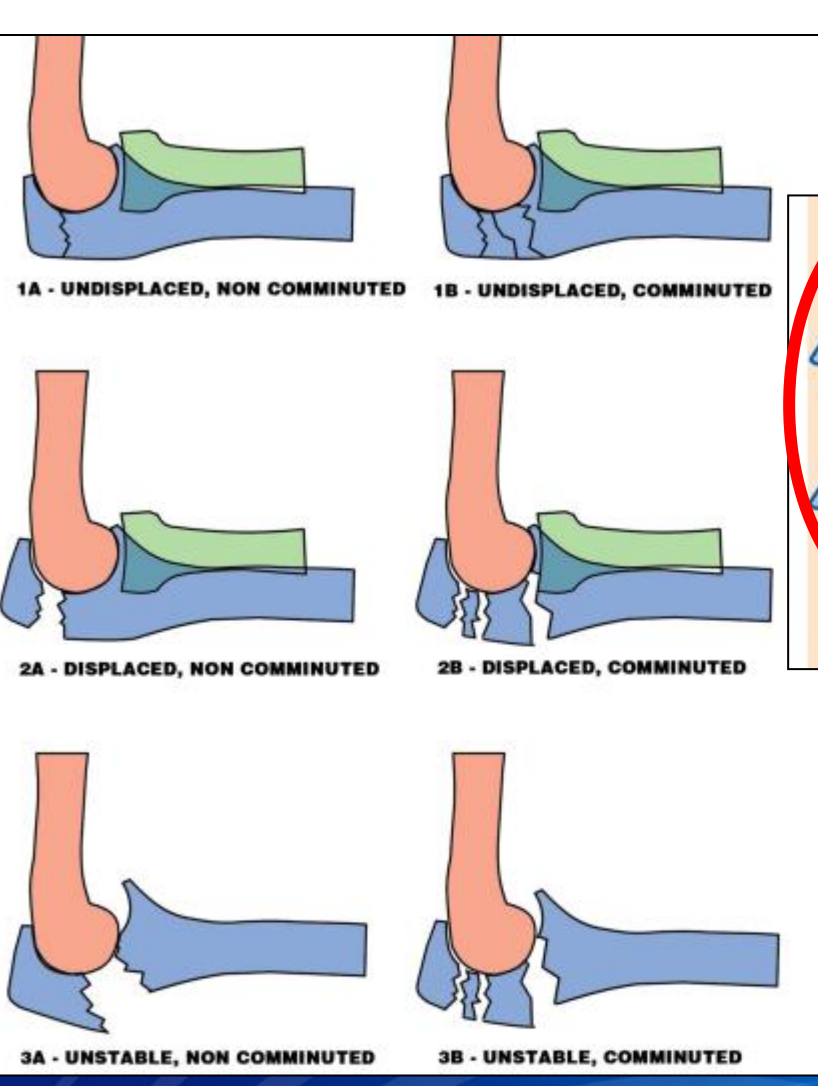
Arthroplasty compared to internal fixation by locking plate osteosynthesis in comminuted fractures of the distal humerus

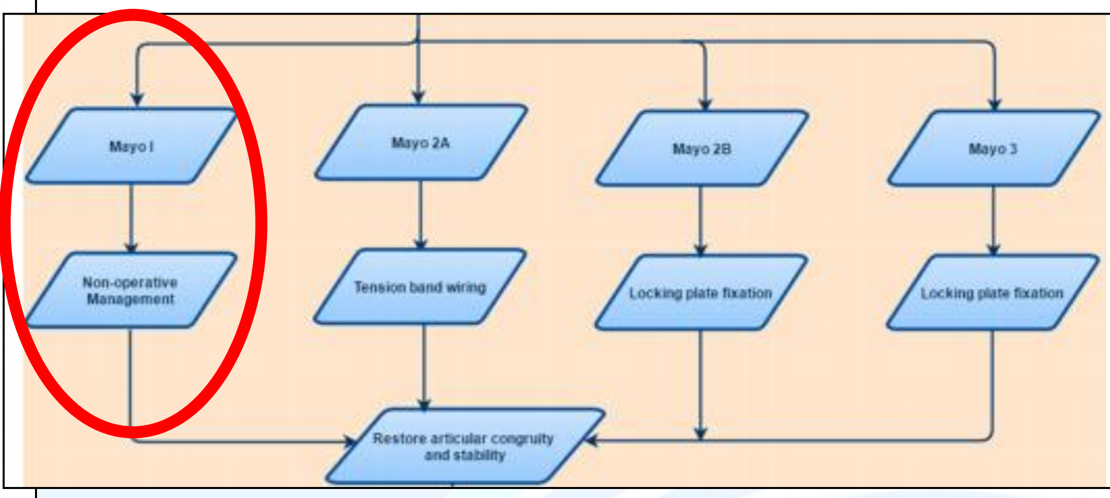
Alexander Ellwein · Helmut Lill · Christine Voigt · Pauline Wirtz · Gunnar Jensen · Jan Christoph Katthagen

fppt.com

olecranon







Musculoskelet Surg (2017) 101:1–9
DOI 10.1007/s12306-016-0449-5

CrossMark

REVIEW

The treatment of olecranon fractures in adults

A. J. Powell[1] · O. M. Farhan-Alanie[2] · J. K. Bryceland[2] · T. Nunn[1]

fppt.com

- No patient underwent additional elbow surgery, for a symptomatic nonunion or for any other cause, within the first year following injury
- Only three patients had minimal loss of power

In conclusion, nonoperative management of displaced olecranon fractures is a viable treatment option for lower-demand patients with multiple comorbidities. These results are comparable with those in the current available literature on the outcome of operative management for this injury.

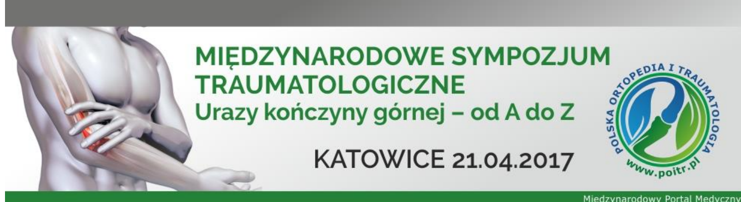
Copyright © 2014 by The Journal of Bone and Joint Surgery, Incorporated

Nonoperative Management of Displaced Olecranon Fractures in Low-Demand Elderly Patients

Andrew D. Duckworth, MSc, MRCSEd, Kate E. Bugler, MRCSEd, Nicholas D. Clement, MRCSEd, Charles M. Court-Brown, MD, FRCSEd(Orth), and Margaret M. McQueen, MD, FRCSEd(Orth)

Investigation performed at Edinburgh Orthopaedic Trauma Unit, Royal Infirmary of Edinburgh, Edinburgh, Scotland

fppt.com



Radial head

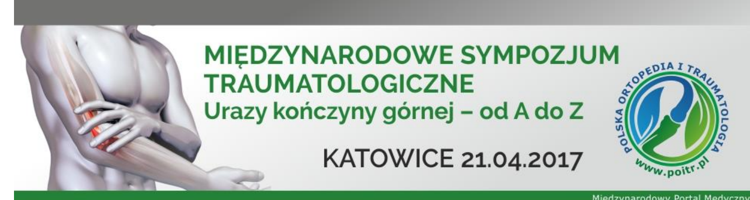
- Type I – Partial head fractures without displacement
- Type II – Partial head fractures with displacement
- Type III – Comminuted fractures involving the whole head
- Type IV – Radial head fracture associated with an elbow dislocation (Added by **Johnston**)

Broberg and **Morrey** modification is inclusion of radial neck fractures and definition of displaced fractures as fracture displacement >2mm and fragment size >30% of the articular surface.

Type I Type II Type III

fppt.com

Radial head



Mason type	Indication	Treatment options[1]
I	All	Conservative with early motion
II	Stable	Conservative with early motion or ORIF
	Unstable	Conservative with early motion or ORIF
	Block with rotation	ORIF
III	2-3 simple fragments	ORIF
	> 3 unstable fragments	Arthroplasty
IV	See above	See above

Submit a Manuscript: http://www.wjgnet.com/esps/
Help Desk: http://www.wjgnet.com/esps/helpdesk.aspx
DOI: 10.5312/wjo.v6.i11.954

World J Orthop 2015 December 18; 6(11): 954-960
ISSN 2218-5836 (online)
© 2015 Baishideng Publishing Group Inc. All rights reserved.

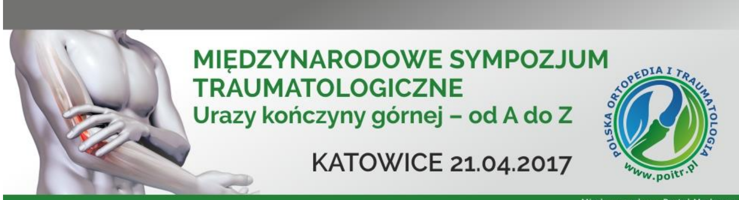
MINIREVIEWS

Current concepts in the management of radial head fractures

Izaäk F Kodde, Laurens Kaas, Mark Flipsen, Michel PJ van den Bekerom, Denise Eygendaal

fppt.com

Radial head



- Simple fractures displaced less than 2 mm can be treated nonoperatively. Prolonged rehabilitation should raise suspicion of complicating additional injuries.
- The treatment of choice for 2 to 5 mm displaced partial articular fractures remains debatable. Several investigators report good results of nonoperative treatment comparable to open reduction and internal fixation (ORIF) but with lower complication rates. However, rate of osteoarthritis seems to be higher with nonoperative treatment.

Fractures of the Radial Head

Klaus Josef Burkhart, MD[a,*], Kilian Wegmann, MD[b], Lars P. Müller, MD[b], Frank E. Gohlke, MD[a]

Conclusions

No clinical benefit with ORIF could be found compared to nonoperative management of isolated partial articular radial head fractures with displacement of greater than 2 mm but less than 5 mm at short-term followup. A well-designed randomized trial and followup at longer term are required to provide better information about how to treat these common fractures.

Clin Orthop Relat Res (2014) 472:2105–2112
DOI 10.1007/s11999-014-3541-x
Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

SYMPOSIUM: TRAUMATIC ELBOW INSTABILITY AND ITS SEQUELAE

Is ORIF Superior to Nonoperative Treatment in Isolated Displaced Partial Articular Fractures of the Radial Head?

Albert Yoon MBChB, Graham J. W. King MD, MSc,
Ruby Grewal MD, MSc

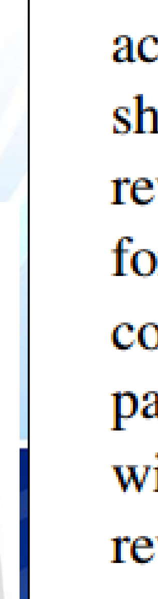
Eur J Orthop Surg Traumatol (2014) 24:1133–1137
DOI 10.1007/s00590-013-1386-8

ORIGINAL ARTICLE

MIĘDZYNARODOWE SYMPOZJUM
TRAUMATOLOGICZNE
Urazy kończyny górnej – od A do Z
KATOWICE 21.04.2017
POLSKA ORTOPEDIA I TRAUMATOLOGIA
www.poitr.pl
Międzynarodowy Portal Medyczny

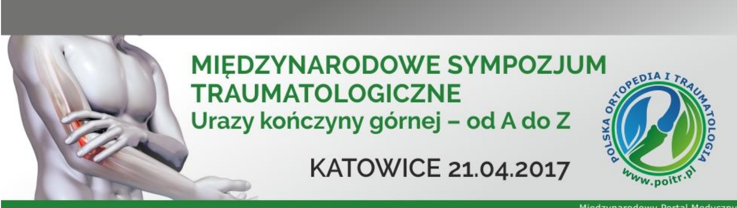
Management of Mason type 1 radial head fractures: a regional survey and a review of literature

Samer S. S. Mahmoud · Abdul Nazeer Moideen ·
Rahul Kotwal · Khitish Mohanty



Based on our literature review on the subject, we believe that the best protocol of treatment would be joint aspiration within 6 h of injury [24]. This should be followed by immobilisation in broad arm sling for 48 h [22] after which active mobilisation and extension stretching exercises should be encouraged [18]. The patients should then be reviewed in fracture clinic at 1 week following the injury for a further clinical assessment to exclude an injury to the collateral ligaments. Provided it is an isolated injury, patients can be discharged to physiotherapy at this stage with an advice to attend a further clinical and radiological review in 6 weeks in case there is no improvement.

Radial head



the high complication rate occurring after radial head replacement in comparison with radial head resection, as well as good functional results obtained with this last technique, leads us

to recommend it for comminuted radial head fractures without associated instability.

Aging Clin Exp Res (2015) 27 (Suppl 1):S77–S83
DOI 10.1007/s40520-015-0425-1

CrossMark

ORIGINAL ARTICLE

Mason type II and III radial head fracture in patients older than 65: is there still a place for radial head resection?

Giuseppe Solarino[1] · Giovanni Vicenti[1] · Antonella Abate[2] · Massimiliano Carrozzo[1] · Girolamo Picca[1] · Biagio Moretti[1]

Injury, Int. J. Care Injured 47S3 (2016) S29–S34

Contents lists available at ScienceDirect

ELSEVIER

Injury

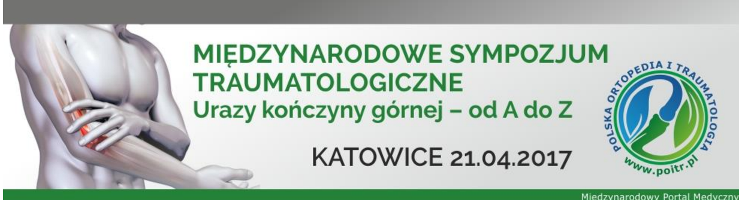
journal homepage: www.elsevier.com/locate/Injury

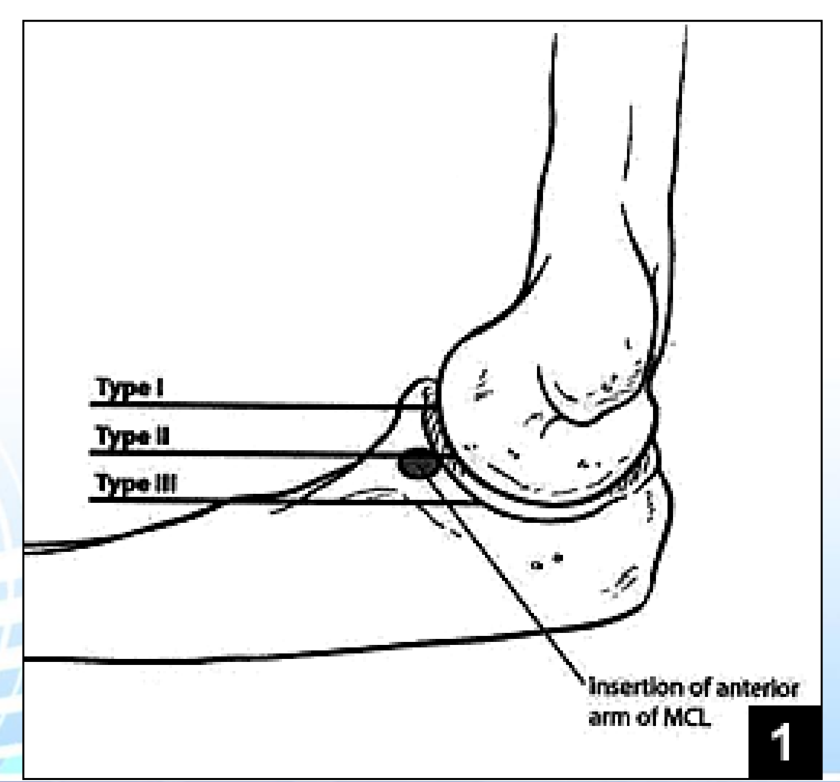
Comminuted fractures of the radial head: resection or prosthesis?

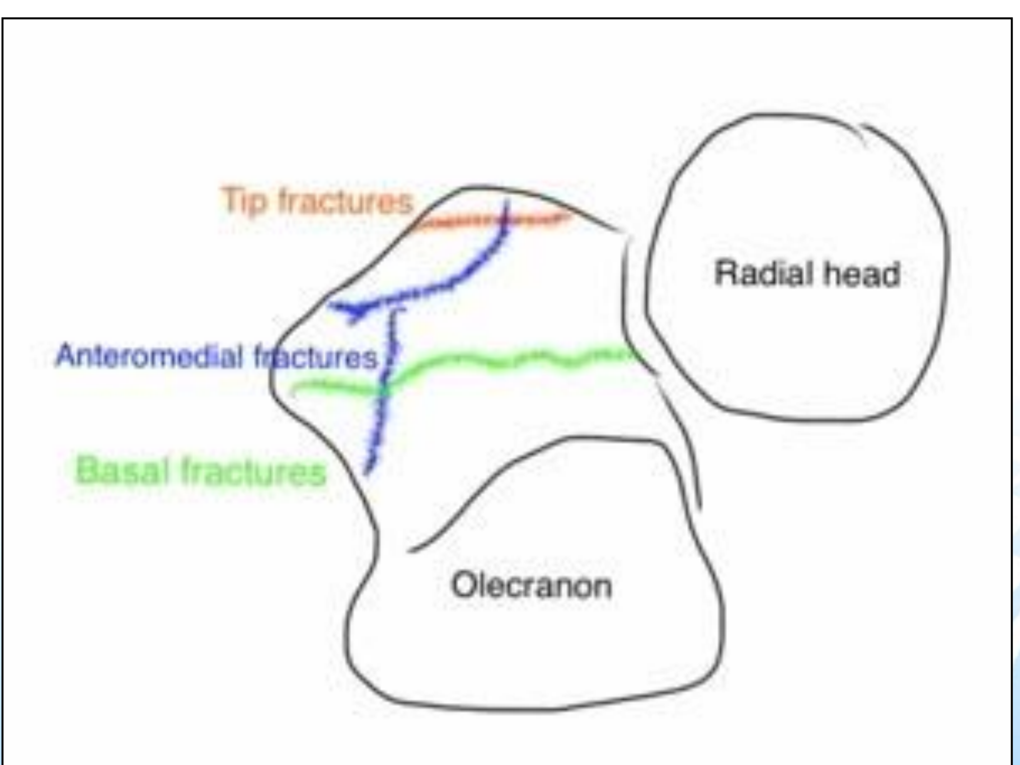
Yaiza Lópiz*, Ana González, Carlos García-Fernández, Javier García-Coiradas, Fernando Marco
Shoulder and Elbow Unit, Department of Orthopaedic Surgery, Clínico San Carlos Hospital, Complutense University of Madrid, Madrid, Spain

fppt.com

Coronoid Fractures



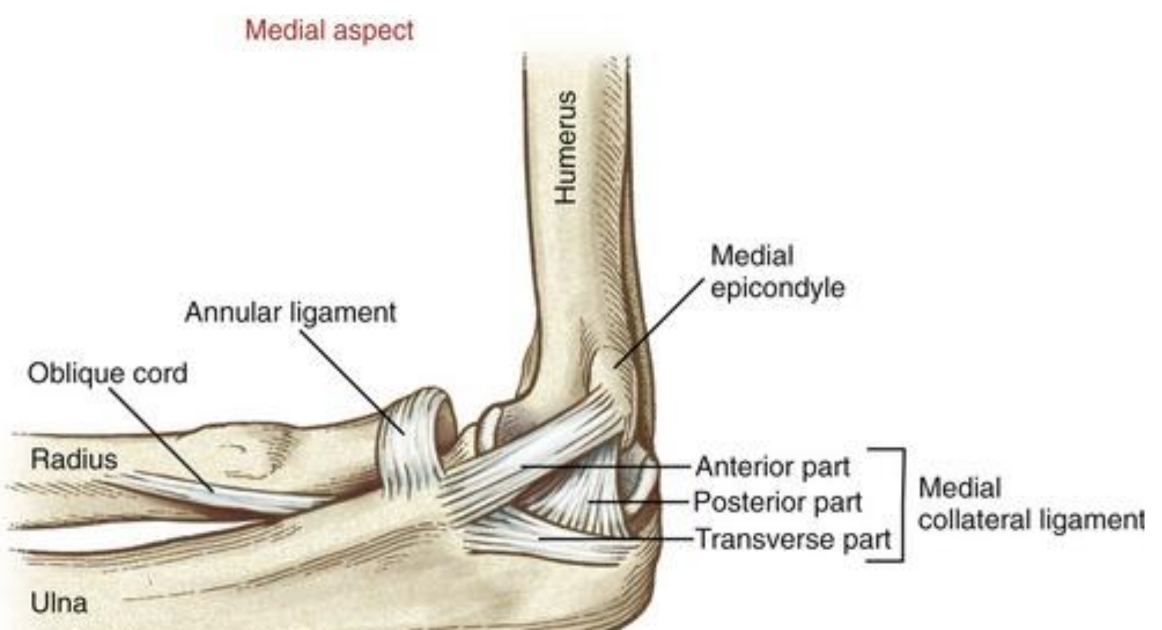




Regan and Morrey classification

O'Driscoll classification

fppt.com

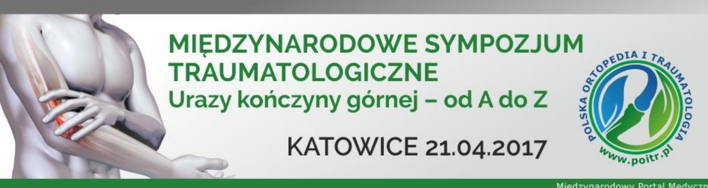


Medial **Lateral**

- Joint capsule
- Anular ligament
- Ulnar collateral ligament
- Radial collateral ligament

fppt.com

nonoperative treatment



- anteromedial facet fractures can be considered if subluxation is excluded and the fracture is small and minimally displaced
- Type I (**Regan and Morrey**) – avulsion of the tip of the coronoid process, which does not require internal fixation

Orthopaedic Surgery (2009), Volume 1, No. 4, 269–274

ORIGINAL ARTICLE

Treatment of fractures of the ulnar coronoid process

You-hua Wang MD, Qing-bing Meng MD, Jia-dong Wu MD, Jian-chuan Ma MD, Fan Liu MD

Department of Orthopaedics, Affiliated Hospital of Nantong University, Nantong, China

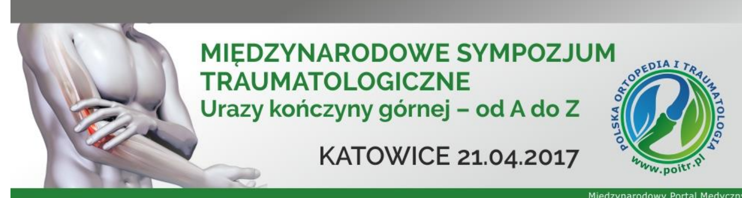
J Orthop Trauma. 2015 Oct;29(10):437-40. doi: 10.1097/BOT.0000000000000326.

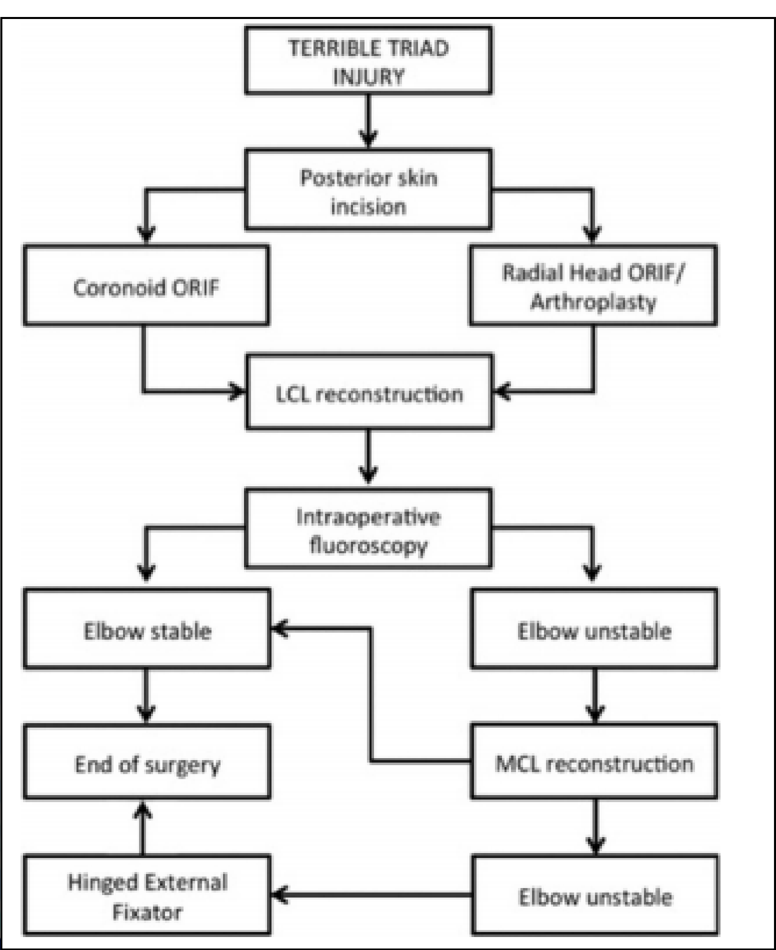
Coronoid Fractures.

Ring D[1], Horst TA.

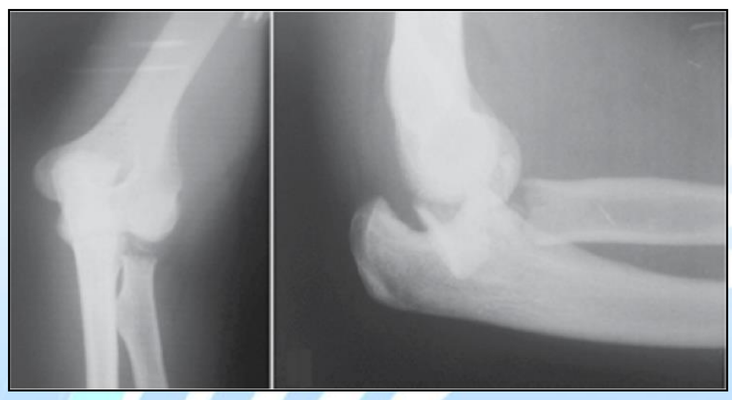
fppt.com

terrible triad injury





Elbow dislocation associated with both radial head and coronoid fractures



Injury. 2015 Dec;46 Suppl 8:S68-76. doi: 10.1016/S0020-1383(15)30058-9.

Terrible triad of the elbow: is it still a troublesome injury?

Giannicola G[1], Calella P[2], Piccioli A[2], Scacchi M[2], Gumina S[2].

fppt.com

Radial Head Fixable?

Yes → Repair Coronoid → ORIF Radial Head

No → Perform Radial Neck Cut then Repair Coronoid → Radial Head Arthroplasty

Repair Lateral Ligaments

Is Elbow Stable?

Yes → No Further Repair

No → Repair MCL +/- External Fixation

Clin Orthop Relat Res (2014) 472:2075–2083
DOI 10.1007/s11999-014-3475-3

Clinical Orthopaedics and Related Research®

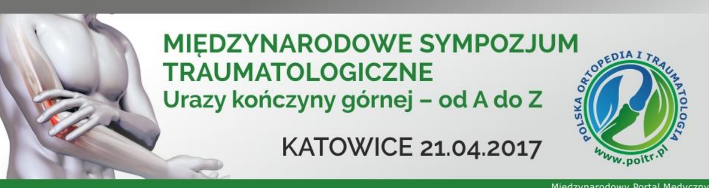
SYMPOSIUM: TRAUMATIC ELBOW INSTABILITY AND ITS SEQUELAE

Single-staged Treatment Using a Standardized Protocol Results in Functional Motion in the Majority of Patients With a Terrible Triad Elbow Injury

Akash Gupta MD, David Barei MD, Ansab Khwaja BA,
Daphne Beingessner MD

fppt.

nonoperative treatment



Terrible triad injuries with **type I and II** coronoid process fractures **can be effectively treated without fixation of coronoid fractures** when repair or replacement of the radial head fracture and reconstruction of the LUCL complex sufficiently restores intraoperative stability of the elbow through a functional range of motion.

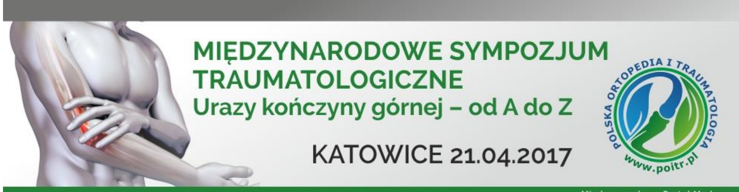
Clin Orthop Relat Res. 2014 Jul;472(7):2084-91. doi: 10.1007/s11999-014-3471-7.

Terrible triad injuries of the elbow: does the coronoid always need to be fixed?

Papatheodorou LK[1], Rubright JH, Heim KA, Weiser RW, Sotereanos DG.

fppt.com

ORIF or replacement



radial head arthroplasty afforded the ability to obtain elbow stability with comparable overall outcomes when compared to ORIF. As these injuries commonly occur in younger patients, longer-term studies will be required to ascertain whether the apparent benefits of radial head arthroplasty are offset by late complications of arthroplasty, *such as loosening.*

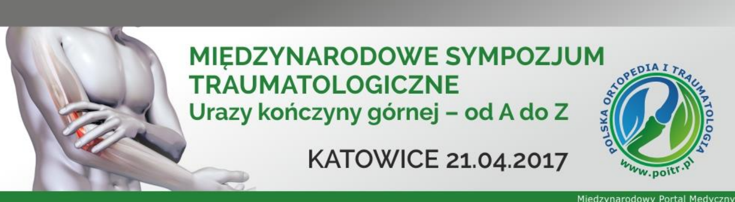
Clin Orthop Relat Res. 2014 Jul;472(7):2128-35. doi: 10.1007/s11999-013-3331-x.

Fixation versus replacement of radial head in terrible triad: is there a difference in elbow stability and prognosis?

Watters TS[1], Garrigues GE, Ring D, Ruch DS.

fppt.com

Nonoperatively ?



In selected patients, nonoperative treatment of terrible triad injuries is an option that can provide good function and restore stable elbow ROM. However, nonoperative management requires close clinical and radiographic followup to monitor for any delayed elbow subluxation or fracture displacement.

Clin Orthop Relat Res (2014) 472:2092–2099
DOI 10.1007/s11999-014-3518-9

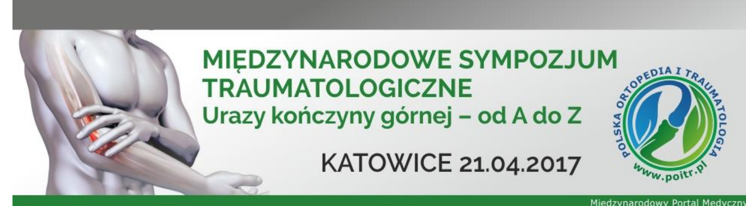
Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

SYMPOSIUM: TRAUMATIC ELBOW INSTABILITY AND ITS SEQUELAE

Can We Treat Select Terrible Triad Injuries Nonoperatively?

Kevin Chan MD, MSc, Joy C. MacDermid BScPT, MSc, PhD,
Kenneth J. Faber MD, MHPE, FRCSC,
Graham J. W. King MD, MSc, FRCSC,
George S. Athwal MD

fppt.com



Nonoperatively ?

- a concentric joint reduction,
- a radial head fracture that did not cause a mechanical block to rotation,
- a smaller coronoid fracture (Regan-Morrey Type 1 or 2)
- a stable arc of motion to a minimum of 30 of extension to allow active motion within the first 10 days.

Clin Orthop Relat Res (2014) 472:2092–2099
DOI 10.1007/s11999-014-3518-9

Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

SYMPOSIUM: TRAUMATIC ELBOW INSTABILITY AND ITS SEQUELAE

Can We Treat Select Terrible Triad Injuries Nonoperatively?

Kevin Chan MD, MSc, Joy C. MacDermid BScPT, MSc, PhD,
Kenneth J. Faber MD, MHPE, FRCSC,
Graham J. W. King MD, MSc, FRCSC,
George S. Athwal MD

fppt.com

Robert Wilk, Damian Kusz

Złamania okolicy łokcia - kiedy i kogo operować?

POLISH ORTHOPAEDICS AND TRAUMA SURGERY

Fractures of the elbow – when and whom should we operate?

www.poitr.pl

International Medical Portal

SAMODZIELNY PUBLICZNY SZPITAL KLINICZNY NR 7 ŚLĄSKIEGO UNIWERSYTETU MEDYCZNEGO W KATOWICACH
Górnośląskie Centrum Medyczne im. prof. Leszka Gieca

Thank you for the attention

fppt.com