

**Surgical Correction of Congenital Superior Radioulnar
Synostosis**
Systematic review and meta-analysis

Submitted By

Amr Abd-Alhameed AL-Sahlamy

Bachelor of Medicine and Surgery Ain Shams University

For Partial Fulfillment of the Master Degree in

Orthopaedics

Under supervision of:

Prof. Dr. Nabil Abdelmoneam Ghaly

Professor of Orthopedic Surgery

Ain-shams University

Dr. Mohamed Ahmed Al-kersh

Assoc. Professor of Orthopaedic Surgery

Ain-shams University

Faculty of medicine

Ain shams university

2019

Acknowledgement

First I thank ALLAH , the all Mighty, The Gracious, all knowing for his aid and guidance .

My extreme thanks and gratefulness to my great mentors / Prof. Dr. Nabil Abdelmoneam Ghaly (Professor of Orthopedic Surgery, Ain-shams University) and Dr.Mohamed Al-kersh (Lecturer of Orthopedic Surgery, Ain-shams university) who gave me a great support and helped me a lot to do this work.

I want to thank my mentors for their patience and strict supervision ,great efforts ,guidance and moral support all through this work

Table of contents

List of figures	I
List of tables	II
Introduction	1
Aim of the work	3
Anatomy	4
Embryology	9
Diagnosis	13
Treatment	22
Materials and methods	25
Results	29
Discussion and conclusion	37
References	39
Arabic summary	42

List of figures

FIG 1	Anatomy of the forearm	P:4
FIG 2	Sagittal section through the left elbow joint: medial aspect.	P:5
FIG 3	The left elbow joint ligaments. A) medial aspect; B) lateral aspect	P:7
FIG 4	Synovial cavity of the left elbow joint	P:8
FIG 5	Specification of the axes of the developing limb	P:11
FIG 6	Axes of the developing limb, apical ectodermal ridge, zone of polarizing activity	P:12
FIG 7	Shoulder adduction compensates for deficient supination	P:16
FIG 8	X-ray in left forearm with Congenital radioulnar synostosis	P:17
FIG 9	Radiographs showing proximal radioulnar synostosis with absence of the head of the radius	P:17
FIG 10	CT examination of the elbow joint	P:18
FIG 11	3D CT represents congenital radioulnar synostosis	P:19
FIG 12	Xray showing large syostosis mass	P:20
FIG 13	Xray showing reduced radial head without bony synostosis	P:21
FIG 14	Xray showing dislocated radial head	P:21
FIG 15	Approach for Osteotomy at the distal diaphysis of the radius.	P:23
FIG 16	picture showing osteotomy at two levels distal radius and proximal ulna	P:23
FIG 17	Included and excluded studies	P:27

List of figures

FIG 1	Anatomy of the forearm	P:4
FIG 2	Sagittal section through the left elbow joint: medial aspect.	P:5
FIG 3	The left elbow joint ligaments. A) medial aspect; B) lateral aspect	P:7
FIG 4	Synovial cavity of the left elbow joint	P:8
FIG 5	Specification of the axes of the developing limb	P:11
FIG 6	Axes of the developing limb, apical ectodermal ridge, zone of polarizing activity	P:12
FIG 7	Shoulder adduction compensates for deficient supination	P:16
FIG 8	X-ray in left forearm with Congenital radioulnar synostosis	P:17
FIG 9	Radiographs showing proximal radioulnar synostosis with absence of the head of the radius	P:17
FIG 10	CT examination of the elbow joint	P:18
FIG 11	3D CT represents congenital radioulnar synostosis	P:19
FIG 12	Xray showing large synostosis mass	P:20
FIG 13	Xray showing reduced radial head without bony synostosis	P:21
FIG 14	Xray showing dislocated radial head	P:21
FIG 15	Approach for Osteotomy at the distal diaphysis of the radius.	P:23
FIG 16	picture showing osteotomy at two levels distal radius and proximal ulna	P:23
FIG 17	Included and excluded studies	P:27

List of tables

Table 1	Jebsen-Taylor hand-function test	P:15
Table 2	Radiographic classification of Cleary and Omer	P:20
Table 3	Master sheet of the papers included in the study	P:30
Table 4	Results of Superior radioulnar synostosis correction by single osteotomy	P:31
Table 5	Results of Superior radioulnar synostosis correction by double osteotomy	P:32
Table 6	Results of Superior radioulnar synostosis correction by excision of synostosis	P:33
Table 7	Results of Superior radioulnar synostosis correction by Vascularized fascio-fat flap	P:34
Table 8	Demographic data of all groups of the study	P:35
Table 9	Comparison between mean range of motion at different groups	P:36

Abstract

Background: Synostosis, or osseous union represents a failure of differentiation of parts of any two adjacent bones and can involve any part of the upper extremity. Synostosis between the radius and ulna can be congenital or post-traumatic

Objective: To review various methods of surgical treatment in management of congenital superior radioulnar synostosis to know which of them is more efficient and had better results

Methods: Our study is asystematic review of different surgical options in managment of superior radioulnar synostosis which included four methods of treatment as we classified them into four groups.

Results: We analysed the results found in our included papers and founded that : Mean age of operation at single and double osteotomy was less than other two groups but with no significant difference. Mean Range of motion improvement was the best with double osteotomy with mild changes in comparison to other groups with no significant difference .

Conclusion: According to the study the best method and the more save with more satisfactory results for correction of congenital superior radioulnar synostosis is double osteotomy distal to synostosis mass.

Introduction

Congenital radioulnar synostosis is a rare problem and is thought to be a failure of longitudinal segmentation between the radius and ulna at the 7th week of gestation. Because it is due to a defect in utero, it may be associated with some musculoskeletal anomalies and congenital syndromes such as polydactyly, syndactyly and thumb deformity⁽¹⁾.

Congenital radioulnar synostosis was first described by Sandifort in 1793. Congenital radioulnar synostosis is one of numerous components of malformation syndromes in children with chromosomal aberration. It is believed that this malformation is related to chromosome X aberrations. Some cases of congenital radioulnar synostosis was found in chromosome Y aberrations⁽²⁾.

Deformity occurs equally in both males and females and bilateral involvement occurs in 60% to 80% of patients. In addition, family history has also been positive in some cases. Because of the fusion of the proximal radioulnar joint, patients always presented with a fixed degree of pronation, and the degree of pronation determine the degree of the disability and age of presentation, the more the degree of deformity the more degree of disability and the more early age of presentation⁽¹⁾.

Congenital radio-ulnar synostosis is the most frequent congenital anomaly around the elbow joint. Some disabilities in daily activities occurs such as failure to scoop up water in the hands, to use a table knife, fork or chopsticks, or to drink water from a glass. In older children, the main complaint is often difficulty in sport⁽³⁾.