

DISCUSS THE MANAGEMENT OF 8YEAR OLD GIRL WITH VOLKMAN'S ISCHAEMIC CONTRACTURE

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OUTLINE

INTRODUCTION

- Overview
- Causes/risk factors
- pathogenesis

MANAGEMENT

- Evaluation
- Classification
- Treatment
- Complication
- Follow up
- Outcome
- Prognosis
- Prevention
- Conclusion
- references

INTRODUCTION

OVERVIEW

Complex variable deformities

- Crippling affecting the extremities
- Described in 1881 by Richard Von Volkmann
- Develop from neglected compartment syndrome
- Involves muscle ischaemia, necrosis leading to fibrosis and contracture
- Management is challenging
- Multidisciplinary approach

Introduction continue

RISK FACTORS

Decreased compartment size

- Constrictive Cast, Dressing, splint, TBS Splint
- Closure of fascial defect
- Burn eschar

Increased compartment content

- Displaced humeral supracondylar fracture
- Diaphyseal forearm bones #
- Vascular injury
- Bleeding diasthesis
- Snake bite
- Extravascular infusion of hypertonic saline
- Infection

Introduction continue

PATHOGENESIS

- Result from many injuries
- Decrease capillary perfusion
- Muscle necrosis occur after 4hrs of ischaemia
- Irreversible nerve damage after 12hours
- Necrotic muscles replace by fibrotic tissues
- Fibrotic tissues matured 6months to one year

MANAGEMENT

- EVALUATION
 - HISTORY
 - Deformity
 - Progression
 - Complication
 - Hand dominance
 - Courses
 - Medical and surgical history
 - Drug history
 - History of differential diagnosis

EXAMINATION

LOOK:

- Dysmorphic scars
- Extensive wasting
- Joint contractures
Forearm, wrist and hand
deformities

FEEL :

Neurologic deficit,
contractures joints and soft
tissues

MOVE:

- Volkmann's sign, decrease
range of motion

CLINICAL PHOTOGRAPH

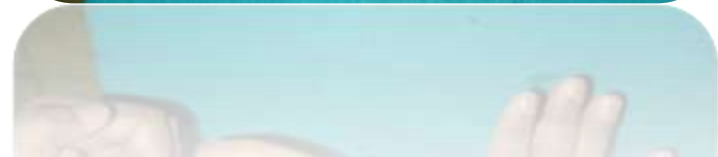
DIAGNOSIS

MSS EXAMINATION



MSS EXAM. CONT.

- Intrinsic plus or intrinsic minus hand posture
- +ve Volkmann's sign
- Wrist in flexion def.
- +/-pronated forearm
- Cord-like induration
- +/-elbow stiffness
- ↓ROM @ MPJ,IPJ
- Impaired sensation



Intrinsic minus hand posture

- Weak intrinsic \neq strong extrinsic. Thus
 - MPJ = hyperextension
 - DIP, PIP wrist = flexion



INVESTIGATIONS

X-RAY:

Forearm bones fractures, humeral supracondylar fractures, elbow dislocation

ANGIOGRAM:

Identify major vascular injury, plan for muscles transfer

CT SCAN:

Non-invasive, contrast avoid the need for angiogram, extent of muscles involvement, prognostication, required for Tsuge classification

INVESTIGATIONS...

MRI:

- Better soft tissue resolution

- Identify nerve course and compression

- More expensive

EMG:

DIRECT NERVE STIMULATION:

- Useful during surgery, confirm nerve status, help in deciding between neurolysis and nerve graft

INVESTIGATIONS...

Others,

- FBC,ESR,
- Hb genotype
- URINALYSIS
- GXM

CLASSIFICATION

- Different ways,
- Zancolli
- Seddon
- Tsuge
- Holden
- Bunnel

TSUGE CLASSIFICATION

MILD

- Muscle involved
- FDP
- FPL
- No nerve involvement

MODERATE

- Muscle involvement
- FDP,FPL,PDS
- Wrist and thumb flexors
- Neurologic involvement
- deformities

TSUGE CLASSIFICATION

SEVERE

- All flexor muscle involved
- Few extensors involved
- Neurologic involvement
- Severe contractures
- Deformities
- Bone deformities

DIFFERENCIAL DIAGNOSIS

- Peripheral nerve lesion
- Neurologic disorders e.g. Cerebral palsy
- Arthrogryposis
- Birth trauma e.g. Erb palsy
- Tendon lesion
- Joint disorders
- Bone lesions

TREATMENT

PECULIARITIES

Female

Growing

School age

CHALLENGES/PROBLEMS

Deformity

Impaired function

Cosmesis

Mgt demands

knowledge of functional
anatomy,

normal mechanisms of
balanced movement of
wrist and fingers

TREATMENT...

GOALS

Re establish joints/hand movements

Re establish sensation

Correct deformities

Preserve, strengthen remaining muscle functions

TREATMENT...

OPTIONS

- NON OPERATIVES

- OPERATIVES

OPERATIVES PRINCIPLES

- Counselling
- Physiotherapy
- Consent
- Choice of anaesthesia
- Tourniquet
- Good lighting
- Operating loops
- Antibiotics
- Analgesics

TREATMENT...

MILD (LOCALIZED)VIC

Physiotherapy

Tendon lengthening or transfer

Z-plasty of shortened FDS,FDP,FPL

Stretching splint

TREATMENT...

MODERATE(CLASSIC) VIC

Physiotherapy

Tendon lengthening

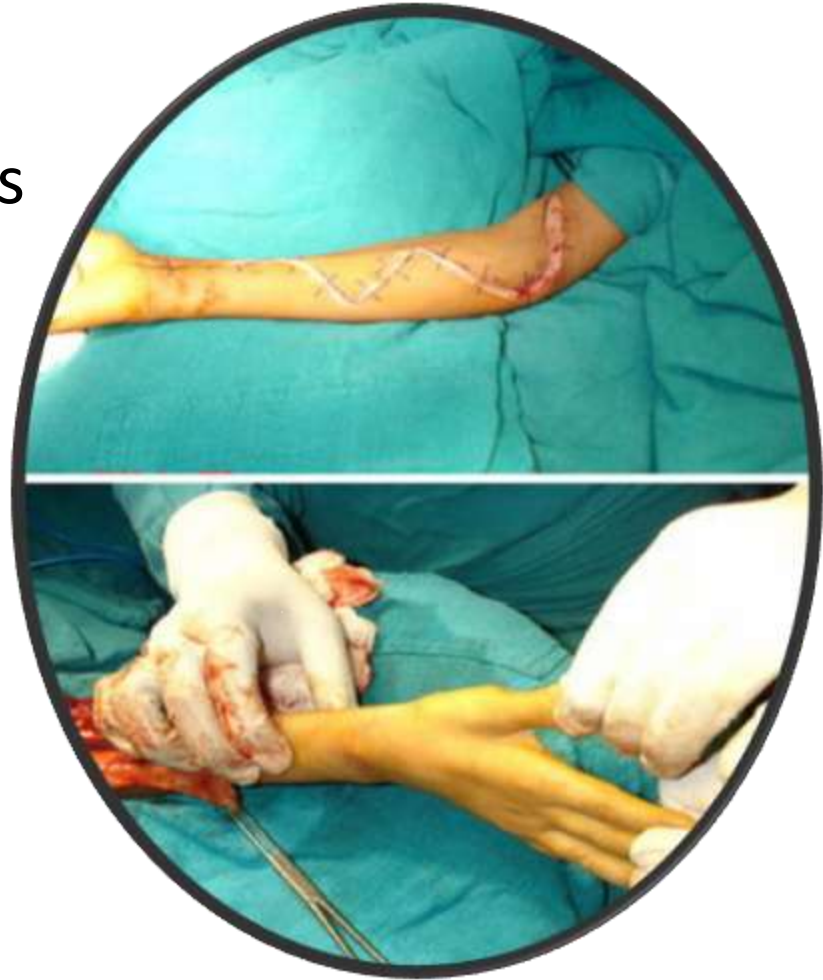
Tendon transfer

Muscle sliding ,Max Peg

Neurolysis

MUSCLE SLIDING OPERATION

- I/N: flexor contracture with good muscle mass
- PROCEDURE:



Neurolysis



TREATMENT...

SEVERE VIC

Functional muscle transfer

Physiotherapy

Free tissue transfer using

Stretching

latismus dorsi

gracilis

Scar excision

Arthrodesis

Bone shortening/ Carpectomy

Amputation

Neurolysis

POST OP CARE

- General

Immobilization 6/52 above elbow cast, 3/52 below elbow,

Night splint 3/12

Proper physiotherapy

Follow up ,prolonged rehabilitation protocols up to 2 years



POST OP. PHYSIO



COMPLICATIONS

Wound infection,

Dehiscence

Flap necrosis

Neurovascular injuries

Residual deformity

COMPLICATIONS...

- Flap necrosis
- Persistent deformity



OUTCOME

Dexterity score

Hand grip strength

Sensibility

Appearance

PROGNOSIS

- Depend on the type, severity

PREVENTION

- Health education
- Improve socio economic status
- Avoid constricting dressing, cast
- Immediate identification of compartment syndrome and early treatment

CONCLUSION

Treatment depend on the type
proper planning is indispensable for good
outcome

Rigorous post-op physiotherapy

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THANK YOU

FOR LISTENING