DISSCUSS 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
- Bunnell
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
DIFFERENTIAL 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

OPERATIVES PRINCIPLES
- Counselling
- Physiotherapy
- Consent
- Choice of anaesthesia
- Tourniquet
- Good lightening
- 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
Physiotherapy
   Stretching
Scar excision
Bone shortening/ Carpectomy
Neurolysis

Functional muscle transfer
Free tissue transfer using latismus dorsi gracilis
Arthrodesis
Amputation
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