Optimal forearm position allowing maximum hand function:

A quasi-experimental study in adolescent children

Nirmal Raj Gopinathan[1], Vishnu Baburaj[1], Nitin Koundal[2], Harpreet Singh[2], Neelesh Kumar[2], Pebam Sudesh[1], Mandeep Singh Dhillon[1]

[1]Postgraduate Institute of Medical Education and Research, Chandigarh

[2]CSIR-CSIO: Central Scientific Instruments Organisation, Chandigarh

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BACKGROUND

- Aim - to determine the ideal forearm position (pronation/supination) that allows maximum upper-limb function.
- In certain congenital/ acquired upper limb disorders, the management boils down to sacrificing rotatory movements of forearm.
- Position of fusion that facilitates maximum upper limb function is a topic of debate and is decided upon personal preferences and assumptions.
- Although literature has many level five evidence reports, there is lack of well-designed research and we intended to study it both in dominant and non-dominant limbs.

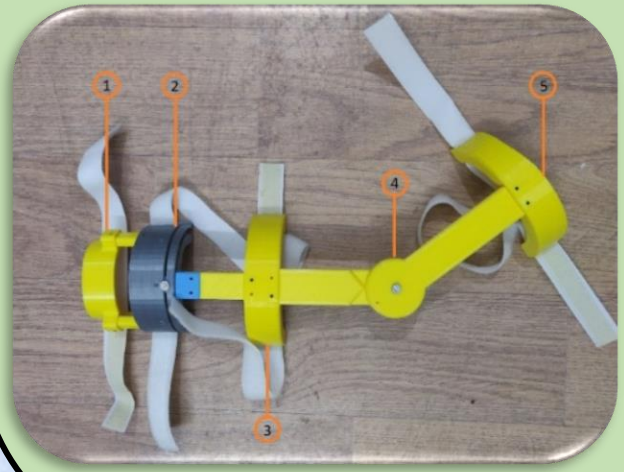
QUESTIONS

- Q1: Which fixed forearm position (in terms of pronation/supination) has the greatest functional outcome that can be used during forearm arthrodesis?
- Q2: Does this ideal forearm position differ between the dominant and non-dominant side?
- Q3: What will be the ideal position of fusion if both upper limbs require simultaneous arthrodesis?

Source: www.wikiclipart.com

METHODS

- 15 healthy adolescent volunteers were fitted with a custom adjustable brace that simulated forearm arthrodesis in five rotatory positions (full pronation, 45° pronation, mid-prone i.e. neutral pronation supination, 45° supination and full supination).
- They were asked to carry out a series of activities as per the Sollerman's hand function test, and each activity was scored using the standardised scoring system.
- The test was carried out with the brace fitted first in the dominant side, followed by the non-dominant side, and finally in both the upper limbs together.



FINDINGS

- The mid-prone position allowed for the best function overall in both dominant and non-dominant upper limbs.
- If both upper limbs required simultaneous fusion, our results suggest that fixing the dominant side in mid-prone and non-dominant side in 45° supination would be ideal.
- For unilateral forearm arthrodesis, the ideal position of fusion is the same irrespective of dominance of the limb, whereas for bilateral arthrodesis, limb dominance is to be taken into consideration.

Acknowledgements

I would like to acknowledge the contributions made by CSIR-CSIO Chandigarh for design and fabrication of the custom forearm brace. I also thank all the volunteers for taking part in this study

Contact

Dr Nirmal Raj Gopinathan
Additional Professor
Department Of Orthopedics
PGIMER Chandigarh
Email: dr.nirmalraj78@gmail.com