A Functional Thumb Metacarpal Extension Blocking Splint

As therapists, we frequently perform manual massage, scar massage and joint mobilizations. These types of treatments often can cause pain at the metacarpal joint of the therapist’s thumb. Other professions, as well as activities, may also produce symptoms in this joint. The authors of this article have developed a splint to help protect our thumbs. — PEGGY L. FILLION, OTR, CHT, Practice Forum Editor

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Hyperextension of the first metacarpophalangeal (MCP) joint is commonly observed in persons with certain occupations, such as hand therapists (Figure 1) and musicians.1 People with arthritis2,3 or hypermobile joints are also prone to this condition. This may be due to reduced stability of the first carpometacarpal (CMC)2 and/or MCP joint,3 which subsequently leads to degenerative changes. We describe an alternative splint, based on Van Lede’s4 anti-swan neck splint for the fingers, which restricts MCP joint extension of the thumb.

FABRICATION

Materials:
1. A 2.5-mm microperforated Orfilight™ or 1.6-mm microperforated Orfit™ soft (North Coast Medical).
2. A 2.5-cm-wide stretch loop thick elastic strapping (Homecraft AbilityOne) self-adhesive hook Velcro® (North Coast Medical).

Instructions:
1. Cut thermoplastic in a rectangle, with the length being from the CMC joint to tip of the thumb and the width twice that of the thumb (Figure 1).
2. Mold the softened thermoplastic over the dorsum of the thumb, ensuring that the MCP joint is between 35 and 40 degrees of flexion (Figure 2).
3. Lightly mark the thermoplastic to indicate the lateral borders of the thumb, allowing a little extra length to roll distal and proximal ends. Draw a circle to encompass the MCP joint line. This will form the window allowing MCP flexion (Figure 3).
4. Trim the splint to size. Cut the window large enough to allow MCP flexion, but not too large, as this will weaken the splint (Figure 4).
5. Carefully mark the MCP crease so the volar bar can be applied accurately (Figure 5). Soften a piece of thermoplastic 2 cm wide by 8 cm long and turn its edges in to form a thin smooth bar.
6. Place the trimmed dorsal hood on the thumb and mould the thermoplastic bar around the MCP joint crease. Spot heat and stick the ends to the base (Figure 6). Ensure the volar bar is placed exactly over the MCP crease, to maintain MCP flexion. If it is too tight, then the radial digital nerve could be compromised. Alternatively, if it is too loose, then there is not enough stability at the MCP joint.
7. Roll back the proximal and distal ends of the dorsal hood and the window to decrease pressure areas and increase comfort (Figure 6).
8. Burn ends of the elastic strap to decrease fraying. Spot heat the volar aspect of the dorsal hood and press the strap into the material firmly on an angle so it sits comfortably around the wrist (not over the hypothenar muscles).
Attach a small circle of self-adhesive hook Velcro® on the dorsal aspect of the splint for receiving the end of the strap. Figure 7 shows the final positioning of the splint on the thumb.

**Possible modifications to the splint may be:**

- Lengthen the splint proximally to increase CMC joint support.
- Lengthen the splint distally to restrict the interphalangeal joint extension.
- If the strapping requires frequent replacement, apply two small self-adhesive hook Velcro® attachments instead of one.
Use/Wearing the splint:

Suggested population might be therapists, musicians, and industrial workers. It could also be worn during activities such as peeling potatoes, scrubbing/cleaning, gardening, and playing a musical instrument.

SUMMARY

The advantages of this functional thumb splint are: wrist and palm are entirely free allowing movement and sensation of the thumb and hand, and thumb flexion is limited minimally.

REFERENCES