

# Mean 5-Year Follow-up for Suture Button Suspensionplasty in the Treatment of Thumb Carpometacarpal Joint Osteoarthritis

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**Purpose** Suture button suspensionplasty (SBS) has been used to treat thumb carpometacarpal joint osteoarthritis (CMC joint OA). Although promising short-term outcomes have been reported, no outcomes beyond 4 years have been published. The aim of this article is to report intermediate outcomes of SBS.

**Methods** We reviewed the charts of 14 patients who underwent 16 SBS procedures for symptomatic thumb CMC joint OA. We recorded demographic data, preoperative Eaton stage, length of follow-up, *Quick*—Disabilities of the Arm, Shoulder, and Hand questionnaire scores, as well as pinch strength, grip strength, range of motion, and metacarpal subsidence. Operative time and postoperative complications were documented.

**Results** Average age was 64 years. There were 12 women and 2 men. Preoperative Eaton stages were III and IV in 8 thumbs each. Mean operative time was 93 minutes. Mean follow-up was 64 months with mean *Quick*—Disabilities of the Arm, Shoulder, and Hand score improvement of 58.2. Mean palmar and radial abduction were 105% and 97%, respectively, of the nonsurgical thumb. Kapandji scores for all operated thumbs were either 9 or 10. Pinch and grip strength were 107% and 102%, respectively, of the nonsurgical side. Mean trapezial space height was 71%. One patient underwent removal of a symptomatic implant and 2 patients had transient neuropraxia of the dorsal radial sensory nerve.

**Conclusions** Favorable outcomes (improvement in range of motion and pain relief) of SBS remain durable over time. Our results show that improvement in strength may also be expected over time when using SBS after trapeziectomy for the treatment of thumb CMC joint OA. (*J Hand Surg Am.* 2017; ■(■):1.e1-e11. Copyright © 2017 by the American Society for Surgery of the Hand. All rights reserved.)

**Type of study/level of evidence** Therapeutic IV.

**Key words** Thumb, carpometacarpal joint, osteoarthritis, suture button suspensionplasty.



**T**HUMB CARPOMETACARPAL (CMC) JOINT osteoarthritis (OA) is a common condition that affects women more commonly and becomes increasingly prevalent with age.<sup>1,2</sup> The mainstay of

initial treatment includes activity modification, placement of an orthosis, nonsteroidal anti-inflammatory medications, and intra-articular steroid injections.<sup>3</sup> Surgery is indicated if a trial of nonsurgical

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treatment does not alleviate the patient's symptoms adequately.

There is a vast array of options once surgical intervention is contemplated. These include metacarpal extension osteotomy,<sup>4</sup> CMC joint arthrodesis,<sup>5</sup> total joint arthroplasty,<sup>6</sup> and trapeziectomy with its many variations including ligament reconstruction and tendon interposition (LRTI),<sup>7</sup> abductor pollicis longus suspensionplasty, hematoma distraction arthroplasty (HDA),<sup>8</sup> and suture button suspensionplasty (SBS).<sup>9</sup> Other choices involve interposition of either prosthetic implants<sup>10</sup> or autogenous tissue.<sup>11</sup> Interestingly, although studies have found that some procedures have a higher complication rate, there been no evidence thus far to suggest that one procedure is more efficacious than another.<sup>12</sup> In fact, the only common element, apart from the metacarpal extension osteotomy, is that all techniques include removal of the articulation at the CMC joint either by removing bone or arthrodesis. Beyond that, the techniques and practice for surgical treatment of thumb CMC joint OA vary worldwide.<sup>13,14</sup>

In our practice, we have combined full or hemitrapeziectomy with suspension of the thumb metacarpal using a suture button device, which we termed SBS, and employ this as our first choice procedure for the surgical treatment of thumb CMC joint OA. Full trapeziectomy with SBS is typically performed as an open procedure for Eaton stage 3 and 4 disease<sup>15</sup> whereas hemitrapeziectomy SBS is done arthroscopically for stage 2 disease.<sup>16</sup> Whereas encouraging early results have been reported,<sup>9,17</sup> no outcomes beyond 4 years have been published. The aim of this article is to report the intermediate outcomes of SBS performed by one surgeon in a small cohort of patients with a mean of 5 years' follow-up.

## MATERIALS AND METHODS

The institutional review board at Stanford University approved this study and we adhered to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines. We reviewed the charts of all 53 patients who underwent SBS by a single surgeon at our institution from 2009 to 2012, and in whom there was at least 48 months of follow-up. After excluding 7 patients in whom SBS was performed as a revision procedure for another surgery performed to treat thumb CMC joint OA and another 2 patients who were deceased, a total of 44 patients were eligible for the study (Fig. 1). Of these 44 patients, 14 patients who underwent 16 SBS procedures for symptomatic thumb CMC joint OA were still in the area and

reachable, and agreed to return for assessment. Of these 16 procedures, 10 were performed on dominant thumbs and 6 on nondominant thumbs. These patients had decided on operative intervention after at least 6 months of nonsurgical treatment. We recorded demographic data, preoperative Eaton stage, length of follow-up, *Quick*—Disabilities of the Arm, Shoulder, and Hand (*QuickDASH*) questionnaire scores, as well as pinch strength, grip strength, range of motion (ROM), and metacarpal subsidence. For pinch strength, grip strength, and ROM, we recorded the outcome as a percentage of the contralateral thumb, except in the 3 cases in which both thumbs were treated. In addition, pinch and grip strength was corrected for the right-dominant patients at 5% and 10%, respectively (eg, for patient 1, we used 95% and 90% of the pinch and grip strength, respectively).<sup>18</sup> Metacarpal subsidence was represented by postprocedure trapezoidal space height as a percentage of preoperative trapezoidal height (measured on preoperative radiographs), in which a larger percentage indicates less subsidence (Fig. 2). To measure trapezoidal space height, one line was drawn connecting the corners of the thumb metacarpal base on a pronated lateral radiograph of the thumb metacarpal and another was drawn connecting the distal 2 corners of the scaphoid. A third line was then drawn along the central long axis of the metacarpal shaft to bisect the former 2 lines. Trapezoidal space height was measured as the distance along the third line that lies between the lines at the metacarpal base and distal scaphoid. Postprocedure trapezoidal space height (b) was expressed as a percentage of preoperative trapezoidal height (a).

We also recorded the operative time of each procedure, postoperative complications, and any further surgery that was required for the same problem. We had full data for 12 patients and had all the data except for pinch strength, grip strength, and ROM in 2 patients who could not come to our clinic for a review owing to geographic distance, although they returned the self-reported DASH questionnaire via e-mail.

## Surgical technique

We employed the surgical technique as previously described<sup>9</sup> and currently use a few modifications aimed at improving the efficiency and safety of SBS. First, we now use a corkscrew found in the Mini-TightRope CMC set (Arthrex Inc., Naples, FL) to gain solid purchase in the trapezium as a joystick so that it is more easily maneuvered for excision of the trapezium as a whole. Second, we use a C-ring targeting guide

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