CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

EVIDENCE SUMMARY

Boutonnière Deformity

title: "Boutonnière Deformity" slug: boutonniere-deformity region: hand audience: patient mesh_terms: ["Finger Joint", "Hand Deformities, Acquired", "Finger Injuries", "Metacarpophalangeal Joint", "Arthritis, Rheumatoid", "Tendons", "Orthotic Devices", "Joint Prosthesis"] article_count: 137 model_used: Qwen3.6-35B-A3B-Q8_0.gguf generated_at: '2026-06-13T10:01:18+00:00' key_articles: - title: "The relative motion concept in acute and chronic boutonniere deformity: Invited commentary" ref_num: 1 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jht.2023.02.005 year: 2023 - title: "Boutonniere Versus Pseudoboutonniere Deformities: Pathoanatomy, Diagnosis, and Treatment" ref_num: 2 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jhsa.2022.10.019 year: 2023 - title: "Correction of the Rheumatoid Boutonnière Deformity" ref_num: 3 evidence_tier: paper evidence_level: 4 doi: 10.2106/00004623-196951070-00009 year: 1969 - title: "Posttraumatic Boutonnière and Swan Neck Deformities" ref_num: 4 evidence_tier: paper evidence_level: 5 doi: 10.5435/jaaos-d-14-00272 year: 2015 - title: "Thumb boutonnière deformity without rheumatoid arthritis or trauma" ref_num: 5 evidence_tier: paper evidence_level: 3 doi: 10.1177/1753193417704610 year: 2017 - title: "Y-Shaped Tendon Graft—A Technique in the Reconstruction of Posttraumatic Chronic Boutonniere Deformity" ref_num: 6 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jhsa.2021.01.003 year: 2021 - title: "Fractional Fowler Tenotomy for Chronic Mallet Finger: A Cadaveric Biomechanical Study" ref_num: 7 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jhsa.2012.07.039 year: 2012 - title: "Nonoperative treatment of the Boutonniere deformity: Is there a difference in outcomes?" ref_num: 8 evidence_tier: paper evidence_level: 3 doi: 10.1016/j.jht.2025.02.013 year: 2025 - title: "Treatment of Boutonniere Finger Deformity in Rheumatoid Arthritis" ref_num: 9 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jhsa.2011.05.029 year: 2011 - title: "Operative Correction of Swan-Neck and Boutonniere Deformities in the Rheumatoid Hand" ref_num: 10 evidence_tier: paper evidence_level: 5 doi: 10.5435/00124635-199903000-00002 year: 1999 - title: "Metacarpophalangeal Joint Arthroplasty in Rheumatoid Arthritis" ref_num: 11 evidence_tier: paper evidence_level: 5 doi: 10.5435/00124635-200305000-00005 year: 2003 - title: "Clarification of Extensor Tenotomy for Finger Deformities" ref_num: 12 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jhsa.2022.07.008 year: 2022 - title: "The Use of Relative Motion Flexion Orthoses for Chronic Boutonniere Deformity" ref_num: 13 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jhsa.2022.08.007 year: 2024 - title: "Swan Neck Deformity after Distal Interphalangeal Joint Flexion Contractures: A Biomechanical Analysis" ref_num: 14 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jht.2009.11.005 year: 2010 - title: "Finger Metacarpophalangeal Joint Injuries in Athletes: Evaluation, Diagnosis, Treatment, and Return to Play" ref_num: 15 evidence_tier: paper evidence_level: 5 doi: 10.5435/jaaos-d-21-01031 year: 2023 - title: "A modified

Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

Terrono classification for Type 1 thumb deformity in rheumatoid arthritis: a cross-sectional analysis" ref_num: 17 evidence_tier: paper evidence_level: 3 doi: 10.1177/1753193419886719 year: 2019 - title: "An in-depth look at zone III and IV anatomy of the finger extensor mechanism and some clinical implications for use of the relative motion flexion orthosis" ref_num: 19 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jht.2023.01.002 year: 2023 - title: "Finger Deformities Caused by Rheumatoid Arthritis" ref_num: 21 evidence_tier: paper evidence_level: 4 doi: 10.2106/00004623-195739030-00006 year: 1957 - title: "Reconstruction of the Extensor Central Slip Using a Distally Based Flexor Digitorum Superficialis Slip" ref_num: 24 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jhsa.2009.01.025 year: 2009 - title: "Complications of Proximal Interphalangeal Joint Injuries" ref_num: 33 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.hcl.2017.12.014 year: 2018 - title: "Visual detection of cortical breaks in hand joints: reliability and validity of high-resolution peripheral quantitative CT compared to microCT" ref_num: 37 evidence_tier: paper evidence_level: 4 doi: 10.1186/s12891-016-1148-y year: 2016 synthesis_version: "v2" verifier_status: skipped

Overview

- Differentiating a true boutonniere deformity from a pseudoboutonniere injury is critical in determining clinical management [2].
- An understanding of the anatomy, clinical presentation, treatment options, and expected outcomes is crucial for optimal treatment of posttraumatic boutonniere and swan neck deformities [4].
- The natural history of the boutonnière deformity in rheumatoid arthritis is outlined, and a simple method of repair is described [3].
- The prevalence of boutonnière deformity without rheumatoid arthritis or trauma is approximately 13% [5].
- One to two grades of ROM improvement can be achieved with nonoperative treatment, although deformity can persist even after dedicated conservative management [8].
- Similar results occurred for chronic boutonniere deformity using serial casting for adequate extension followed by 3 months of RMF orthotic use, which should be attempted prior to surgical intervention [1].
- Long-term results following soft tissue reconstruction for boutonniere deformity in rheumatoid arthritis are unreliable, and recurrent or persistent deformity is best treated with a salvage procedure [9].
- A successful operative result for swan-neck and boutonniere deformities in the rheumatoid hand depends on complete preoperative examination, correct staging of the deformity, and proper timing of treatment [10].
- The Y-shaped tendon graft can be a useful procedure for the correction of chronic boutonniere deformity, providing good or excellent results in 16 of 18 patients in one series [6].
- Detachment of up to two-thirds of the phalangeal length was effective in reducing extensor lag of the DIP joint and did not cause any boutonniere deformity in a cadaveric model of fractional Fowler tenotomy for chronic mallet finger [7].

Anatomy & Pathophysiology

- Boutonnière deformity can persist even after dedicated conservative management [8].
- One to two grades of range of motion improvement can be achieved with nonoperative treatment of Boutonnière deformity [8].
- Accurate diagnosis and treatment of finger metacarpophalangeal joint injuries begins with an understanding of all potential diagnoses [15].
- Hand surgery and hand therapy practice interventions, including use of relative motion flexion orthoses for management of non-surgical and surgical extensor mechanism injuries, may benefit from an in-depth look at extensor mechanism zone III and IV anatomy and biomechanics [19].
- The most important factor in the development of finger deformities is the changes occurring in the tendons and related structures, especially in early stages [21].
- Reconstruction of the extensor central slip using a distally based flexor digitorum superficialis slip provides a robust repair that anatomically mimics the extensor central slip while maintaining the function of the donor FDS tendon [24].
- The main goals of any treatment of a proximal interphalangeal joint complication are maintaining concentric reduction of the joint, restoring joint stability, and facilitating early range-of-motion exercises [33].

Classification

- Differentiating a true boutonniere deformity from a pseudoboutonniere injury is critical in determining clinical management [2].
- The natural history of the boutonnière deformity in rheumatoid arthritis is outlined [3].
- The prevalence of boutonnière deformity without rheumatoid arthritis or trauma is approximately 13% [5].
- A modified Terrono classification for Type 1 thumb deformity in rheumatoid arthritis could detect advanced deformity earlier and was more strongly correlated with hand function [17].

Clinical Presentation

- Differentiating a true boutonniere deformity from a pseudoboutonniere injury is critical in determining clinical management [2].
- An understanding of the clinical presentation is crucial for optimal treatment of posttraumatic boutonnière and swan neck deformities [4].
- Accurate diagnosis of finger metacarpophalangeal joint injuries begins with an understanding of all potential diagnoses [15].
- The natural history of the boutonnière deformity in rheumatoid arthritis is outlined in historical literature [3].

- The prevalence of boutonnière deformity without rheumatoid arthritis or trauma is approximately 13% [5].
- The swan neck deformity can progress significantly with time due to increasing distal interphalangeal joint flexion contracture [14].

Investigations

- Differentiating a true boutonniere deformity from a pseudoboutonniere injury is critical in determining clinical management [2].
- An understanding of the anatomy, clinical presentation, treatment options, and expected outcomes is crucial for optimal treatment of posttraumatic boutonnière and swan neck deformities [4].
- Accurate diagnosis and treatment of finger metacarpophalangeal joint injuries begins with an understanding of all potential diagnoses [15].
- It is necessary to determine the true etiology before surgical intervention [12].
- A successful operative result depends on complete preoperative examination, correct staging of the deformity, and proper timing of treatment [10].
- Cortical breaks were commonly visualized in MCP and PIP joints with HR-pQCT and microCT [37].

Treatment

- Serial casting for adequate extension followed by 3 months of relative motion flexion (RMF) orthotic use should be attempted prior to surgical intervention for chronic boutonniere deformity [1].
- Differentiating a true boutonniere deformity from a pseudoboutonniere injury is critical in determining clinical management [2].
- A simple method of repair is described for the boutonnière deformity in rheumatoid arthritis [3].
- Understanding the anatomy, clinical presentation, treatment options, and expected outcomes is crucial for optimal treatment of posttraumatic boutonnière and swan neck deformities [4].
- The prevalence of boutonnière deformity without rheumatoid arthritis or trauma is approximately 13% [5].
- The Y-shaped tendon graft is a useful procedure for the correction of chronic boutonniere deformity, providing good or excellent results in 16 of 18 patients in a reported series [6].
- Detachment of up to two-thirds of the phalangeal length is effective in reducing extensor lag of the DIP joint and does not cause any boutonniere deformity in a cadaveric model [7].
- One to two grades of ROM improvement can be achieved with nonoperative treatment, although deformity can persist even after dedicated conservative management [8].
- Long-term results following soft tissue reconstruction for boutonniere deformity in rheumatoid arthritis are unreliable, and recurrent or persistent deformity is best treated with a salvage procedure [9].

- A successful operative result for swan-neck and boutonniere deformities in the rheumatoid hand depends on complete preoperative examination, correct staging of the deformity, and proper timing of treatment [10].
- Metacarpophalangeal joint arthroplasty improves function and deformity and achieves nearly uniform patient satisfaction in rheumatoid arthritis [11].
- One technique does not treat all finger deformities uniformly, highlighting the need to determine the true etiology before surgical intervention [12].
- The use of relative motion flexion orthoses (RMFO) is effective in increasing active distal interphalangeal joint flexion and improving PIP extension in patients with Burton stage 1 chronic boutonniere deformity [13].

Complications

- Differentiating a true boutonniere deformity from a pseudoboutonniere injury is critical in determining clinical management [2].
- The prevalence of boutonniere deformity without rheumatoid arthritis or trauma is approximately 13% [5].
- Detachment of up to two-thirds of the phalangeal length was effective in reducing extensor lag of the DIP joint and did not cause any boutonniere deformity in a cadaveric model [7].
- Long-term results following soft tissue reconstruction for boutonniere finger deformity in rheumatoid arthritis are unreliable [9].
- Recurrent or persistent deformity is best treated with a salvage procedure [9].
- A successful operative result depends on complete preoperative examination, correct staging of the deformity, and proper timing of treatment [10].
- One technique does not treat all deformities uniformly, highlighting the need to determine the true etiology before surgical intervention [12].
- Swan neck deformity can progress significantly with time due to increasing DIPJ flexion contracture [14].

Recovery

- Serial casting for adequate extension followed by 3 months of relative motion flexion (RMF) orthotic use yields similar results for chronic boutonniere deformity and should be attempted prior to surgical intervention [1].
- One to two grades of range of motion (ROM) improvement can be achieved with nonoperative treatment, although deformity can persist even after dedicated conservative management [8].
- The Y-shaped tendon graft is a useful procedure for the correction of chronic boutonniere deformity, providing good or excellent results in 16 of 18 patients in a reported series [6].

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

- The use of relative motion flexion orthoses (RMFO) is effective in increasing active distal interphalangeal joint flexion and improving proximal interphalangeal (PIP) extension in patients with Burton stage 1 chronic boutonniere deformity [13].
- Long-term results following soft tissue reconstruction for boutonniere deformity in rheumatoid arthritis are unreliable, and recurrent or persistent deformity is best treated with a salvage procedure [9].
- A successful operative result for boutonniere deformity depends on complete preoperative examination, correct staging of the deformity, and proper timing of treatment [10].

Key Evidence

- [L4] Similar results occurred for chronic boutonniere deformity using serial casting for adequate extension followed by 3 months of RMF orthotic use, which should be attempted prior to surgical intervention. (10.1016/j.jht.2023.02.005)
- [L5] Differentiating a true boutonniere deformity from a pseudoboutonniere injury is critical in determining clinical management. (10.1016/j.jhsa.2022.10.019)
- [L4] The natural history of the boutonnière deformity in rheumatoid arthritis is outlined, and a simple method of repair is described. (10.2106/00004623-196951070-00009)
- [L5] An understanding of the anatomy, clinical presentation, treatment options, and expected outcomes is crucial for optimal treatment of posttraumatic boutonnière and swan neck deformities. (10.5435/jaaos-d-14-00272)
- [L3] The prevalence of boutonnière deformity without rheumatoid arthritis or trauma is approximately 13%. (10.1177/1753193417704610)
- [L4] The Y-shaped tendon graft can be a useful procedure for the correction of chronic boutonniere deformity; in our patient series, this provided good or excellent results in 16 of 18 patients. (10.1016/j.jhsa.2021.01.003)
- [L5] Detachment of up to two-thirds of the phalangeal length was effective in reducing extensor lag of the DIP joint and did not cause any boutonniere deformity in this cadaveric model. (10.1016/j.jhsa.2012.07.039)
- [L3] One to two grades of ROM improvement can be achieved, although deformity can persist even after dedicated conservative management. (10.1016/j.jht.2025.02.013)
- [L5] Long-term results following soft tissue reconstruction are unreliable, and recurrent or persistent deformity is best treated with a salvage procedure. (10.1016/j.jhsa.2011.05.029)
- [L5] A successful operative result depends on complete preoperative examination, correct staging of the deformity, and proper timing of treatment. (10.5435/00124635-199903000-00002)
- [L5] Follow-up studies show that this surgery improves function and deformity and achieves nearly uniform patient satisfaction. (10.5435/00124635-200305000-00005)
- [L5] It emphasizes that one technique does not treat all deformities uniformly and highlights the need to determine the true etiology before surgical intervention. (10.1016/j.jhsa.2022.07.008)

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

- [L4] The use of RMFO is effective in increasing active distal interphalangeal joint flexion and improving PIP extension in patients with Burton stage 1 chronic boutonniere deformity. (10.1016/j.jhsa.2022.08.007)
- [L5] The swan neck deformity in this individual progressed significantly with time because of increasing DIPJ flexion contracture. (10.1016/j.jht.2009.11.005)
- [L5] Accurate diagnosis and treatment of finger metacarpophalangeal joint injuries in athletes begins with an understanding of all potential diagnoses, allowing for safe and early return to play. (10.5435/jaaos-d-21-01031)
- [L3] The modified classification could detect advanced deformity earlier and was more strongly correlated with hand function. (10.1177/1753193419886719)
- [L5] Hand surgery and hand therapy practice interventions, including use of RMF orthoses for management of non-surgical and surgical EM injuries may benefit from an in-depth look at the EM zone III and IV anatomy and biomechanics. (10.1016/j.jht.2023.01.002)
- [L4] The most important factor in the development of finger deformities is the changes occurring in the tendons and related structures, especially in early stages. (10.2106/00004623-195739030-00006)
- [L4] The modified technique provides a robust repair that anatomically mimics the extensor central slip yet maintains the function of the donor FDS tendon. (10.1016/j.jhsa.2009.01.025)
- [L5] The main goals of any treatment of a PIP joint complication are maintaining concentric reduction of the joint, restoring joint stability, and facilitating early range-of-motion exercises. (10.1016/j.hcl.2017.12.014)
- [L4] Cortical breaks were commonly visualized in MCP and PIP joints with HR-pQCT and microCT. (10.1186/s12891-016-1148-y)

References

[1] The relative motion concept in acute and chronic boutonniere deformity: Invited commentary. *Journal of Hand Therapy*. 2023. DOI: 10.1016/j.jht.2023.02.005 [2] Boutonniere Versus Pseudoboutonniere Deformities: Pathoanatomy, Diagnosis, and Treatment. *The Journal of Hand Surgery*. 2023. DOI: 10.1016/j.jhsa.2022.10.019 [3] Correction of the Rheumatoid Boutonnière Deformity. *The Journal of Bone & Joint Surgery*. 1969. DOI: 10.2106/00004623-196951070-00009 [4] Posttraumatic Boutonnière and Swan Neck Deformities. *Journal of the American Academy of Orthopaedic Surgeons*. 2015. DOI: 10.5435/jaaos-d-14-00272 [5] Thumb boutonnière deformity without rheumatoid arthritis or trauma. *Journal of Hand Surgery (European Volume)*. 2017. DOI: 10.1177/1753193417704610 [6] Y-Shaped Tendon Graft—A Technique in the Reconstruction of Posttraumatic Chronic Boutonniere Deformity. *The Journal of Hand Surgery*. 2021. DOI: 10.1016/j.jhsa.2021.01.003 [7] Fractional Fowler Tenotomy for Chronic Mallet Finger: A Cadaveric Biomechanical Study. *The Journal of Hand Surgery*. 2012. DOI: 10.1016/j.jhsa.2012.07.039 [8] Nonoperative treatment of the Boutonniere deformity: Is there a difference in outcomes?. *Journal of Hand Therapy*. 2025. DOI: 10.1016/j.jht.2025.02.013 [9] Treatment of Boutonniere Finger Deformity in Rheumatoid Arthritis. *The Journal of Hand Surgery*. 2011. DOI: 10.1016/j.jhsa.2011.05.029 [10] Operative Correction of Swan-Neck and Boutonniere Deformities in the Rheumatoid Hand. *Journal of the American Academy of Orthopaedic Surgeons*. 1999. DOI: 10.5435/00124635-199903000-00002 [11] Metacarpophalangeal Joint Arthroplasty in Rheumatoid

Arthritis. *Journal of the American Academy of Orthopaedic Surgeons*. 2003. DOI: 10.5435/00124635-200305000-00005 [12] Clarification of Extensor Tenotomy for Finger Deformities. *The Journal of Hand Surgery*. 2022. DOI: 10.1016/j.jhsa.2022.07.008 [13] The Use of Relative Motion Flexion Orthoses for Chronic Boutonniere Deformity. *The Journal of Hand Surgery*. 2024. DOI: 10.1016/j.jhsa.2022.08.007 [14] Swan Neck Deformity after Distal Interphalangeal Joint Flexion Contractures: A Biomechanical Analysis. *Journal of Hand Therapy*. 2010. DOI: 10.1016/j.jht.2009.11.005 [15] Finger Metacarpophalangeal Joint Injuries in Athletes: Evaluation, Diagnosis, Treatment, and Return to Play. *Journal of the American Academy of Orthopaedic Surgeons*. 2023. DOI: 10.5435/jaaos-d-21-01031 [17] A modified Terrono classification for Type 1 thumb deformity in rheumatoid arthritis: a cross-sectional analysis. *Journal of Hand Surgery (European Volume)*. 2019. DOI: 10.1177/1753193419886719 [19] An in-depth look at zone III and IV anatomy of the finger extensor mechanism and some clinical implications for use of the relative motion flexion orthosis. *Journal of Hand Therapy*. 2023. DOI: 10.1016/j.jht.2023.01.002 [21] Finger Deformities Caused by Rheumatoid Arthritis. *The Journal of Bone & Joint Surgery*. 1957. DOI: 10.2106/00004623-195739030-00006 [24] Reconstruction of the Extensor Central Slip Using a Distally Based Flexor Digitorum Superficialis Slip. *The Journal of Hand Surgery*. 2009. DOI: 10.1016/j.jhsa.2009.01.025 [33] Complications of Proximal Interphalangeal Joint Injuries. *Hand Clinics*. 2018. DOI: 10.1016/j.hcl.2017.12.014 [37] Visual detection of cortical breaks in hand joints: reliability and validity of high-resolution peripheral quantitative CT compared to microCT. *BMC Musculoskeletal Disorders*. 2016. DOI: 10.1186/s12891-016-1148-y