Simple Surgical Approach with High-Frequency Radio-Wave Electrosurgery for Conjunctivochalasis

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Objective: To introduce a new simple surgical approach with high-frequency radio-wave electrosurgery to reduce conjunctivochalasis (CCh).

Design: Prospective, noncomparative, interventional case series analysis.

Participants: Twelve patients (20 eyes) with CCh were recruited from the outpatient service of the Department of Ophthalmology, Kangbuk Samsung Hospital, Seoul, Korea.

Methods: On the inferior bulbar conjunctiva, subconjunctival coagulation was performed with a fine-needle electrode using a high-frequency radio-wave electrosurgical unit (Ellman Surgitron; Ellman International, Inc., Hewlett, NY) in coagulation mode.

Main Outcome Measures: Conjunctivochalasis grade; epiphora and dry eye symptoms (the Ocular Surface Disease Index [OSDI]; Allergan Inc., Irvine, CA, holds the copyright); and intraoperative and postoperative complications.

Results: Eighteen eyes (90%) recovered a smooth, wet, and noninflamed conjunctival surface within 1 month and remained stable for a follow-up period of 3 months. At 3 months postoperatively, 18 eyes (90%) had grade 0 CCh. There was a statistically significant decrease of the OSDI score at 3 months postoperatively ($P < 0.001$).

Conclusions: A surgical approach with high-frequency radio-wave electrosurgery produced a significant reduction in CCh and an improvement in symptoms. Radio-wave surgical techniques represent a favorable alternative to surgical treatment of CCh.

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The term *conjunctivochalasis* (CCh), taken from the Greek term meaning "relaxation of the conjunctiva," was first coined by Hughes in 1942.[1] It describes a redundant, loose, nonedematous inferior bulbar conjunctiva interposed between the globe and the lower eyelid. Patients vary in the degree of their symptomatology, ranging from asymptomatic to ocular irritation, pain, subconjunctival hemorrhage, epiphora, dry eye, and ulceration.[2–4] Conjunctivochalasis is associated with disruption of the tear meniscus,[2,5] delayed tear clearance,[3,6] and punctal occlusion.[7] Although the underlying mechanisms that lead to CCh have not been identified clearly,[2,8] evidence for age-related elastotic degeneration of the conjunctiva[9,10] and chronic inflammation[8,11,12] has been put forward in previous studies.

Treatment of CCh varies depending on the severity of symptoms. Asymptomatic eyes can be left untreated and followed periodically for signs of progression. Symptomatic patients are often treated with artificial tears, lubricating gels, corticosteroid drops, antihistamine drops, or nocturnal patching as first lines of treatment.[2] When these approaches fail, surgical removal of the redundant conjunctiva becomes necessary. Different surgical procedures have been described to reduce CCh, such as simple excision,[3,13] excision and amniotic membrane transplantation (AMT) with suture or fibrin glues,[14–17] fixation of the conjunctiva to the sclera,[18] or superficial cauterization with a bipolar electrical cauterizer.[19] However, these surgical procedures introduce certain disadvantages, including prolonged operating time, postoperative discomfort, and suture-related complications.

Radiofrequency instrumentation has a lengthy documented history of use in oral, ophthalmic, plastic, and gynecologic surgery. Radio-wave technology provides good surgical control, precision, versatility, and safety. High-frequency radio-wave electrosurgery minimizes heat dissipation and thus cellular alteration. The clinical benefits include reduced postoperative discomfort, minimal scar tissue formation, maximum readability of histologic specimens, enhanced healing, and excellent cosmetic results. We introduce a new simple surgical approach with high-frequency radio-wave electrosurgery to reduce CCh. To the best of our knowledge, this is the first report of CCh reduction with this type of procedure in the medical literature.

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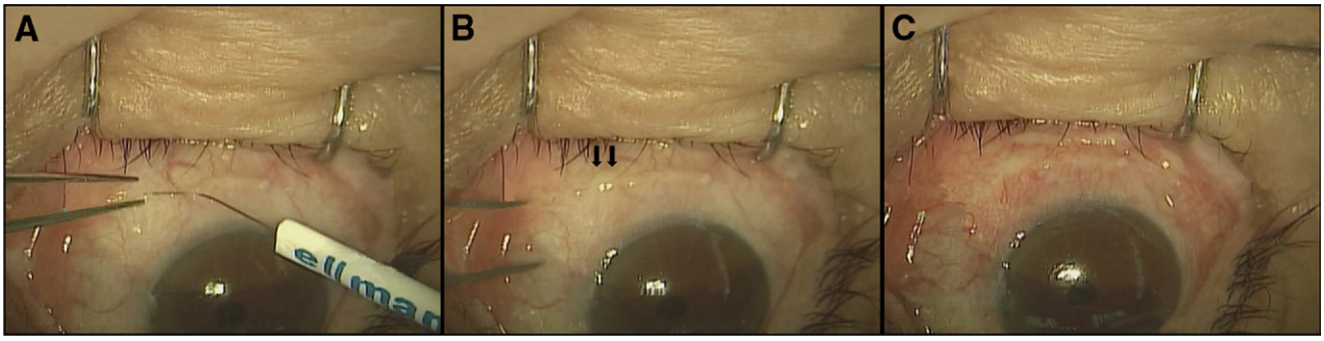

Figure 1. Surgical steps of high-frequency radio-wave electrosurgery for conjunctivochalasis (CCh). **A,** After the redundant inferior bulbar conjunctiva was grabbed and lifted with a 0.12 forceps, subconjunctival coagulations were made with a fine-needle electrode. **B,** After subconjunctival coagulations, there was some conjunctival ridge. This conjunctival ridge disappeared within 1 week postoperatively. **C,** Approximately 10 to 20 subconjunctival coagulations were made primarily in a horizontal direction.

Materials and Methods

Patients

This prospective, noncomparative, interventional case series analysis was performed in adherence with the Declaration of Helsinki and approved by the institutional review board and ethics committee of the Kangbuk Samsung Hospital in Seoul, Korea.

Twelve patients (20 eyes) with CCh were recruited from the outpatient service of the Department of Ophthalmology, Kangbuk Samsung Hospital, and consecutively underwent operations between July 2007 and June 2008.

All patients had symptoms of severe ocular surface irritation for an extended period, despite conventional medical management, including topical lubricating drops or ointments, steroids, cyclosporin A, and antibiotics. Before surgery, all subjects underwent a full medical and ocular history and a detailed ocular examination, including measurement of visual acuity, external eye examination, intraocular pressure measurement, slit-lamp examination and photography, fluorescein staining, and a fluorescein clearance test.

Diagnoses of CCh were made on the basis of the observation of loose conjunctival folds at the inferior lid margin by one of the authors (Choi) using slit-lamp biomicroscopy. Patients with coexistent lid disorders, such as blepharitis or meibomian gland dysfunction, nasolacrimal duct obstruction, corneal disorders, ocular infections, dry eye, or ocular allergy, and those using contact lenses were excluded from the study. Patients with a history of ocular surgery within the last 6 months were also excluded.

Conjunctivochalasis was graded preoperatively and postoperatively according to the grading system proposed by Meller and Tseng.[2] Patients were classified as grade 0 (no persistent fold), grade 1 (a single, small fold), grade 2 (≥2 folds, but not higher than the tear meniscus), or grade 3 (multiple folds and higher than the tear meniscus). Grading was done separately for the temporal, middle, and nasal areas of the conjunctiva. The presence or absence of punctal occlusion, as defined by the contact of the punctum with a redundant conjunctival fold, was noted for the inferior punctum.

Epiphora and dry eye symptoms were specifically evaluated. Dry eye symptoms were assessed with the Ocular Surface Disease Index (OSDI; Allergan, Inc., Irvine, CA, holds the copyright),[20] a 12-item questionnaire designed to assess the severity of symptoms with good to excellent reliability and validity.[21] The 12 items of the OSDI questionnaire were graded on a scale of 0 to 4: 0 = never; 1 = some of the time; 2 = half of the time; 3 = most of the time; and 4 = all the time. The total OSDI score was then calculated with the following formula: OSDI = ([sum of scores for all questions answered] × 100)/([total number of questions an-

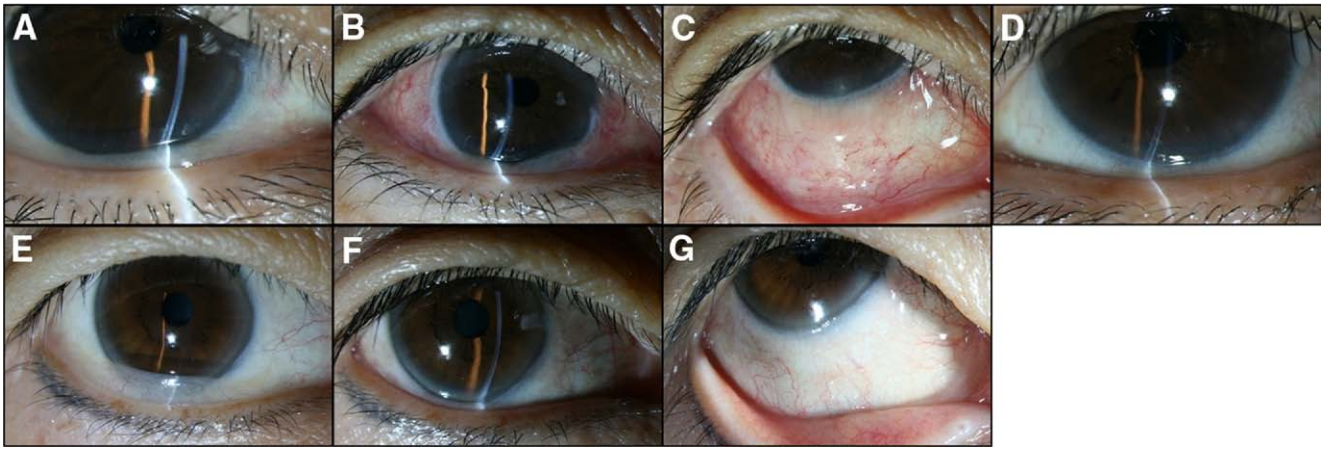

Figure 2. Representative cases of high-frequency radio-wave electrosurgery for conjunctivochalasis (CCh). **A–D,** Case 1. A 67-year-old woman. **A,** Preoperative appearance. **B, C,** One day postoperatively. **D,** One month postoperatively. **E–G,** Case 2. A 59-year-old woman. **E,** Preoperative appearance. **F, G,** One month postoperatively.