

BOOK AND MEDIA REVIEWS

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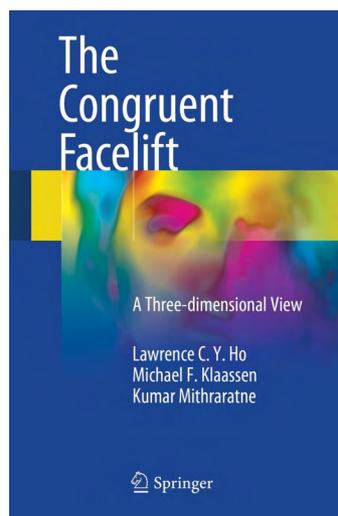
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The Congruent Facelift: A Three-Dimensional View

By Lawrence C. Y. Ho, Michael F. Klaassen, and Kumar Mithraratne. Pp. 131. Springer International Publishing, Berlin, Germany, 2018. Price: \$169.

The authors Lawrence Ho, Michael Klassen, and Kumar Mithraratne, in their book *The Congruent Facelift*, apply sophisticated mathematical modeling to the soft tissues of the face in rest and animation, and then proceed to describe their approach to facial rejuvenation based on the modeling data. The book is divided into four parts.



The first section of their book reviews relevant anatomy two dimensionally. The anatomy discussed is related to nerves, blood vessels, muscles, and fascia. This is likely a review for the experienced surgeon, but it is a well-written description of facial anatomy that has educational benefit for medical students, residents, and junior surgeons.

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Part 2 progresses to a discussion of three-dimensional anatomy of the facial soft tissue. The authors give a detailed analysis of the relationship between the facial planes and supporting ligaments. Specifically, the lower third facial tissues are described in much detail. The authors detail the anatomy of the facial fat compartments, ligaments and septa, and superficial musculo-aponeurotic system and platysma, and provide a three-dimensional analysis of anatomic structure and mimesis.

Part 3 of the book leads by evaluating the three main groups of soft tissue in the face: skin, subcutaneous fat, and muscles. This section evaluates the biomechanical characteristics of these soft tissues with an emphasis on the mimetic muscles of the face. Mechanical analysis of the soft-tissue properties is then explained by defining governing equations, kinematics of deformation, constitutive properties, boundary conditions, and constraints. The biomechanics of the mimetic muscles of the whole face are discussed, and the authors evaluate the structural and functional aspects of these muscles using complex mathematical models. The value of this complex modeling is understanding the structural and functional properties of the tissue, because these properties are important in understanding tissue responses to vector and congruent face lift techniques.

The authors point out that traditionally these procedures have been evaluated from a two-dimensional point of view, which ignores facial volume and treats the face as a two-dimensional object, leading to a noncongruent face lift. The authors' mathematical modeling of the three-dimensional nature of the mimetic muscles allows them to plan a congruent face lift that restores mimetic muscles and tissue in three dimensions, giving a firm, full, youthful appearance of the face. The authors contend that an anatomically based, subject-specific biomechanical computational model of the face is a valuable clinical tool to enable the surgeon to develop an optimal three-dimensional result for each individual patient.

The fourth section begins by discussing the ligaments and septal systems running between the deep dermal surface penetrating this mass and originating in the periosteum. The natural sequela of ligamental and septal laxity and its impact on

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facial features is reviewed. In addition, loss of fat volume within the compartments of the face is discussed. It is in this section that the authors describe their operative technique and present their results.

The procedure is performed using a series of local anesthetic nerve blocks: infraorbital, mental, cervical, and preauricular combined with a neuroleptic anesthetic. Hydrodissection is then performed using 30 cc of Fournier's mix per side. The authors demonstrate a limited inverted "L" incision with two dermal pendant flaps that are marked. A subcutaneous elevation of the cheek flap is then advanced to the zygomatic ligament, the buccal septa, and the masseter ligament, which are all preserved. Mandibular septa are sectioned if needed, and then four contour enforcement loops are placed. The first three loops are secured to the temporalis muscle and the fourth sets the platysmal band to the mastoid fascia. Using an L Ho needle device, a 2-0 Prolene suture is placed through facial septa through a series of described paths to encircle the desired facial tissue. As the suture is tightened, it compresses fat compartments and elevates ptotic tissue to a more youthful position. The skin flap is then repositioned, with the superior dermal pendent secured to the temporal fascia and the inferior pendent secured to the mastoid fascia. Excess skin is removed judiciously, leaving the skin flap under minimal tension. The authors propose their approach is an effective technique in obtaining a youthful, fully supported, nondropped face. The authors show eight patients who have undergone the congruent face lift, with 2- to 4-year postoperative results. After demonstrating their results, the authors discuss common stigmata after face lifts. Although these stigmata may occur with other techniques, I believe that they are minimized in any face lift technique with attention to detail.

The authors combine autologous fat grafting in their approach to facial rejuvenation. They discuss their technique for structural fat grafting. Techniques for harvest, storage, decanting, and injection are described in detail. Preferences in harvest sites are detailed as well. The authors proceed to show a series of patients who have undergone fat grafting. An interesting approach to fat grafting is the authors' use of identifying pilasters, which are marked out on patient images preoperatively. These pilasters are highlight margins of planes and subplanes. Identification of these pilasters in facial regions allows the surgeons to develop an effective fat-grafting strategy to change the patient's facial shape and achieve their goals. Strategic injections can lengthen a short face, taper a square face, widen a narrow face, and alter the projection of the

chin and glabella. The identification of facial pilasters is similar to the approach makeup artists use in contour highlight makeup. The effective creation of highlights and shadows can have a profound effect on the perception of facial form.

The authors are to be congratulated for developing complex mathematical modeling of the facial tissues during rest and mimesis as well as for an effective technique for facial rejuvenation. While each topic is interesting, I feel the book would benefit from a more detailed description of how the modeling is incorporated into each patient's treatment plan or the development of the congruent face lift. Although the described approach is validated by the authors' models, it likely could have been developed independently. Their described approach is on a continuum of the thread lift and the minimal access cranial suspension lift in their use of suture suspension of deep tissue to affect facial volume and shape change. In addition, more detailed images describing the actual placement of the sutures using the Ho needle would be helpful. A video could possibly be made to accompany the text. I feel that the placement and depth of the four sutures per side are critical to obtaining a lasting, symmetric, and aesthetic result. The reader would likely benefit from more detail in this section rather than in the development of the mathematical models.

Having recently evaluated the effects of contour highlight makeup on the perception of facial form, I find the authors' use of their fat-grafting approach implementing these principles to be a valuable contribution. The authors describe how they identify the pilasters of the patient's face and use the patient's marked photographs as guides in surgery to dictate the volume and location of injected fat. Makeup artists have been using the concept of contour highlight makeup in a similar fashion for years to change facial perception through strategic use of light and shadow. The authors are to be commended on their excellent results and an innovative approach to facial fat grafting.

In summary, this book is a quick read (with the possible exception of the mathematical modeling) that describes an innovative, minimally invasive approach to facial rejuvenation. The authors describe their incorporation of structural fat grafting to obtain an ideal result in combination with their congruent face lift. Excellent results are shown with adequate follow-up, giving the reader a realistic assessment of the authors' approach.

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