Revisiting the Scientific Method

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“Truth is sought for its own sake. And those who are engaged upon the quest for anything for its own sake are not interested in other things. Finding the truth is difficult, and the road to it is rough.”

—Ibn al-Haytham

So wrote Ibn al-Haytham (Alhazen), who was born around 965 in Basra (now Iraq, but then part of Persia), lived most of his life in Egypt, and is credited with being an early developer of the scientific method. His road to truth took a wrong turn that almost cost him his life. After claiming that he could use mathematical principles to regulate the flooding of the Nile—and later realizing that this was, in fact, impossible to achieve—he found himself in deep trouble with the reigning powers. To escape execution, he feigned insanity. Placed under permanent house arrest, he continued his scientific explorations (most notably in the field of optics, writing his groundbreaking Book of Optics during this period of confinement) until his death at the age of 76.²

The foundations of the scientific method date back at least a thousand years. Most of us were first introduced to scientific thinking in high school. We were taught that scientific knowledge is based upon a process of gathering observable, empirical, and measurable evidence and then using our powers of reasoning to make sense out of these data.³ It is the scientific method that has enabled our education and training in medicine and plastic surgery. As practicing aesthetic surgeons, whether in the academic or private setting, these same principles must guide our approach to research and reporting of data.

In this issue of the Journal, Chang et al present a fascinating analysis of aesthetic surgery clinical studies published over the past 10 years in several leading journals, including Aesthetic Surgery Journal, to determine the prevalence of evidence-based medicine. The authors conclude that, while some progress has been made in increasing the number of studies with high levels of evidence, the overwhelming majority of articles in the aesthetic surgery literature fall within categories exhibiting low levels of evidence.

In their insightful Commentary, Gupta et al expand upon this finding, while also pointing out a number of important reasons why aesthetic surgery “has historically not been predicated on high-level evidence reports.” Among the reasons: (1) patient satisfaction often is considered more critical than the objective assessment of results; (2) aesthetic surgery necessarily involves customization of procedures for individual cases; and (3) positive outcomes in aesthetic surgery often are largely dependent upon the surgeon’s accumulated experience with a particular technique—a technique which he or she may be reluctant to abandon in favor of a scientifically validated but unfamiliar approach. However, both this Commentary and the article that precedes it conclude with the observation that the scientific method must be employed with greater frequency and commitment by aesthetic surgeons in order to further the goal of optimal patient outcomes.

My background as an academic plastic surgeon has afforded me many opportunities to evaluate so-called “cutting edge” technology. In doing so, my goal has been to objectively separate fact from fiction. As all of us know, many of the devices and products being promoted to (and sometimes by) aesthetic surgeons ultimately fail to live up to the expectations of physicians and patients alike. The problem is that devices and techniques are often widely marketed before they are proven effective by valid scientific methods.

There is a wealth of important research being conducted today in plastic surgery academic centers. A scan of the Plastic Surgery Research Council’s laboratory directory projects reveals that most of this research focuses on topics such as wound healing, adipocyte stem cell biology, tissue engineering and transplantation, gene therapy, and biomaterials.⁴ While these projects are primarily directed toward reconstructive surgery applications, one can easily see their relevance to aesthetic surgery. However, there are many other topics of specific interest to aesthetic surgeons that are in need of scientifically designed research.

Aesthetic plastic surgery is unique in that many of the major contributors to the field are in private practice rather than an academic environment. This should not mean that techniques and technologies in aesthetic sur-
Surgery are evaluated and presented with less scientific rigor than are investigations into stem cell biology or gene therapy. Intellectual curiosity and, most importantly, the desire to offer patients optimal outcomes with maximum safety are the driving forces behind clinical research in aesthetic surgery, but curiosity and good intentions must be combined with proper scientific methods in order to yield the desired results.

It is with great enthusiasm and pride that I begin 2009 as the new Associate Editor of Aesthetic Surgery Journal. As my aesthetic surgery practice has matured over the past decade, I have relied on ASJ to introduce me to many of the surgical techniques I currently practice today. With the Journal’s acceptance for indexing by the National Library of Medicine and with its new Editor in Chief, Foad Nahai, expanding upon the tradition of excellence established by his predecessor, Stanley A. Klatsky, there is no doubt that ASJ will continue to grow and enhance its position as the world’s leading journal of cosmetic surgery.

Dr. Nahai and I share the belief that our Journal, like the specialty of plastic surgery as a whole, must promote the concept of evidence-based medicine. Objective clinical studies evaluating the safety and efficacy of surgical techniques and potentially useful new technologies are sorely needed by aesthetic surgeons, who rely on such research in making day-to-day clinical decisions. Further, our Journal and plastic surgery must promote and recognize basic science research that has implications for and can improve, our clinical practice. That is why Dr. Nahai and I plan to redouble the Journal’s already active solicitation of clinically translational research that offers the possibility to improve outcomes and enhance patient safety. Now that ASJ is indexed in MEDLINE/PubMed, we anticipate even greater participation from researchers and clinicians within academic centers and those in private practice.

As a practicing aesthetic plastic surgeon, I value the opportunity to read experts’ accounts of “How I do it” with regard to their preferred surgical techniques. This type of practical information, for which ASJ has always been first in its field, is still an important aspect of our Journal. It is also critical, however, that we demand objective science to allow us to accurately assess surgical outcomes, device performance, and product effectiveness. We must recognize that while there is a place for appropriately presented anecdotal reports, our general adherence to principles of the scientific method will ultimately allow us to produce the best outcomes for our patients and to provide them with the safest and most effective treatment options.

ASJ is the “go to” journal for all your aesthetic surgery practice needs. I am personally excited about and dedicated to further enhancing the quality, validity, and relevance of all the material presented within the pages of the Journal. I urge you to submit your important work to ASJ. You have our commitment of a fair and objective peer review, the rapid publication of accepted papers, and a showcasing of your scientific and clinical research in the world’s leading cosmetic surgery journal, available in print and online, and now indexed in MEDLINE/PubMed.

DISCLOSURES

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REFERENCES


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