

ORIGINAL SCIENTIFIC INVESTIGATION

Bicipital Augmentation: A Retrospective Review of 94 Patient Cases

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Objective: Reality, documentary, and makeover programs have all helped to eliminate certain taboos previously associated with cosmetic surgical procedures. As a direct result of this phenomenon, men have expressed greater interest in cosmetic surgery. Over the past 5 years, Dr Chugay and colleagues have been working to promote the use of a bicipital prosthesis for aesthetic augmentation of the biceps muscle. This article is designed to further elucidate the complications that have been encountered with the procedure to date and changes in technique that have made this a viable option for male muscular enhancement.

Methods: A retrospective review of prospectively collected data on 94 patients was undertaken to determine the cosmetic improvements and complications seen in the patient population. Silicone prostheses were placed below the biceps muscle in each case to provide greater definition and fullness in the region of the biceps.

Results: Over a 5-year period, 94 patients underwent bicipital augmentation. Of those cases, there were 3 major complications. One patient developed a large seroma due to poor compliance with postoperative instructions for compressive garment use. A second patient suffered a dislodgement of the implant with protrusion of the implant from beneath the muscle. The third complication encountered was that of compartment syndrome in a patient who underwent both biceps and triceps augmentation.

Conclusion: Despite the risks inherent in performing surgery in the upper extremity, the bicipital augmentation procedure is a means by which the male physique can be enhanced with minimal risk of complication when performed using our technique.

The media has popularized male cosmetic surgery in recent years, making it more acceptable for the male patient to seek improvements in his physique. Despite attempts at betterment through physical activity and weight training, some men are unable to achieve their desired outward appearance. It is to this end that Chugay Cosmetic Surgery Institute has striven to improve the male physique through the use of silicone prostheses inserted to increase bulk in the areas of the biceps, triceps, gluteus, pectoralis, and calf. Over the past 5 years, Dr Chugay and colleagues have been working to promote the use of a bicipital prosthesis for aesthetic augmentation of the biceps muscle. This article is designed to review our experiences with the procedure to date, elucidate the complications that have been encountered with the procedure, and review changes in technique that have made this a viable option for male physical enhancement.

Materials and Methods

The prospectively collected data of 94 patients who had undergone bicipital augmentation over the past 5 years were reviewed for postoperative complications and aesthetic results. The literature was reviewed to compare postoperative complications seen in our patient database with cases of bicipital reconstruction, as reported in the literature.^{2,3} All patients reviewed herein underwent the same procedure, composed of insertion of a custom bicipital implant (AART Corp, Las Vegas, Nev) in a submuscular plane with meticulous hemostasis and closure in layers.

Procedure in Detail

As explained in the initial description of the procedure in 2006, the patient has a silicone implant placed into a sub-bicipital plane to increase fullness in the bicipital region. First, the biceps contour is marked out with a surgical marking pen, taking special care to

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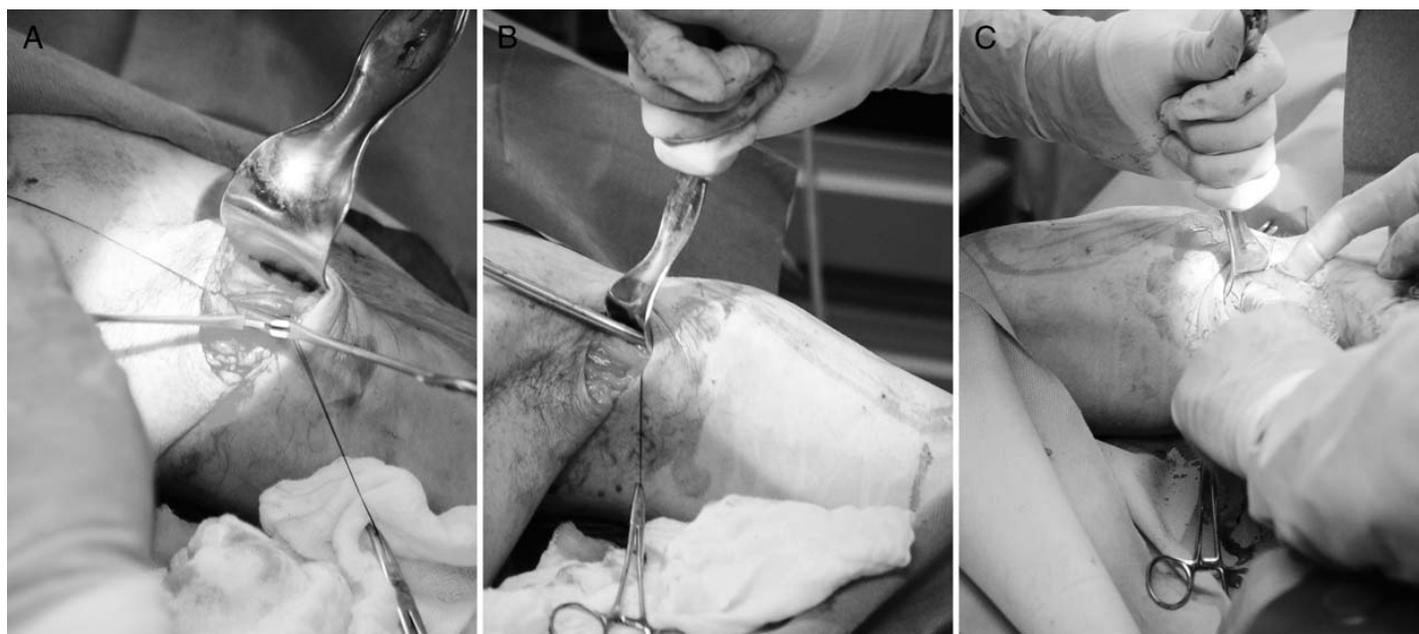


Figure 1. (A) Depicts the 3-0 nylon stay sutures placed for retraction of the pocket and dissection of the pocket. (B) Spatula dissector used to undermine the tissues beneath the biceps muscle to create a pocket. (C) Insertion of bicipital implant.

also mark the apex of the biceps muscle. A marking is then made in the axillary region for the initial incision in the axilla. After initial incision, blunt dissection is performed with the operator's digit to expose the bicipital fascia. This is then incised with a 15 blade, and 3-0 nylon sutures are placed into the fascia for retraction (Figure 1A). A subfascial plane is created using finger dissection, exposing the biceps muscle. The muscle fibers are then spread in a longitudinal fashion with a curved hemostat, and a pocket is dissected underneath the biceps digitally and with a spatula dissector (Figure 1B). A solid silicone implant is inserted into the submuscular pocket from the contralateral side of the table, allowing for easy placement of the implant (Figure 1C). The biceps muscle is then reapproximated with 3-0 Vicryl sutures. Next, the bicipital fascia is repaired with 4-0 Vicryl suture in running fashion. The skin is then closed in subcuticular fashion using 4-0 Monocryl suture.

The patients are sent home with explicit directions for postoperative activity and wound care. On discharge, the patients have their arms wrapped in elastic compression sleeves to diminish the amount of swelling and potential for seroma formation. These sleeves are to be worn at all times for a period of 2 weeks. Also, the patients are asked to avoid heavy lifting and strenuous activity for 1 month. They are allowed to shower within 3 days of operation, keeping the

operative site clean with peroxide and bacitracin. Beginning on postoperative day 4, the patients are asked to begin painting the incision with Betadine twice daily.

Results

Figures 2 through 4 present preoperative and postoperative figures of our patients. In our initial discussion of bicipital augmentation, the potential complications discussed included infection, seroma development, bleeding, implant extrusion, asymmetry, scarring, muscle damage, nerve damage, and implant malposition. The initial cases were relatively free of complication but did have some notable complications. Of these early complications, the 2 most notable were hypertrophic scarring and neurapraxia. In reviewing all 94 cases, there were only 3 major complications encountered, namely, large seroma formation, implant dislodgement, and the development of compartment syndrome.

The most common complication encountered in the early cases was hypertrophic scarring. This was minimized in future cases by performing multilayer closure with absorbable monofilament suture material. By doing so, significant tension on the wound edges was avoided, thereby decreasing the incidence of excessive scarring. Also, the early cases performed saw 2 cases of numbness in the lateral aspect of the

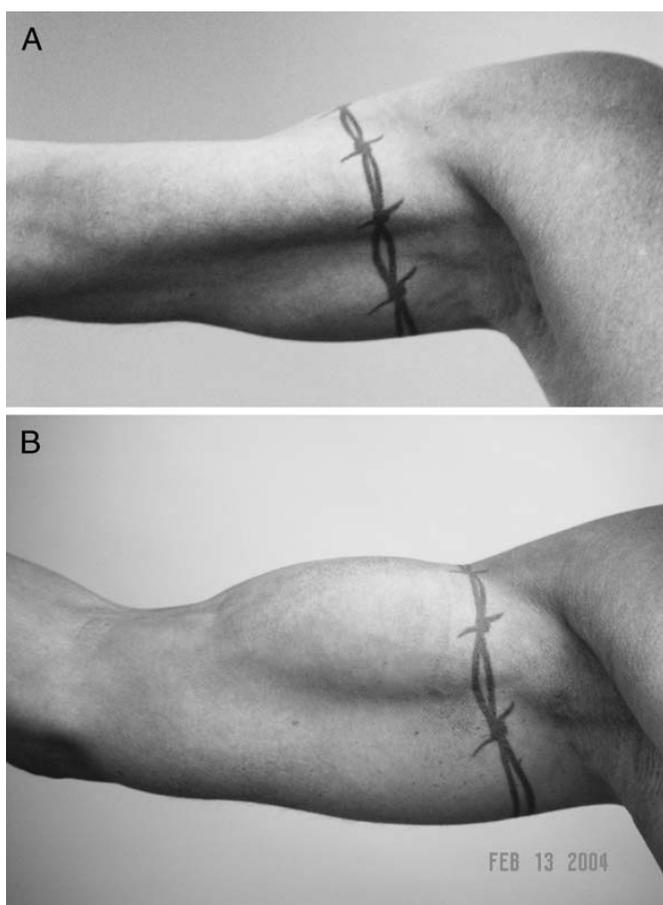


Figure 2. (A) Before bicep augmentation (patient 1).
(B) After bicep augmentation (patient 1).

forearm, in the distribution of the lateral antebrachial cutaneous nerve. Although these cases were self-limited and resolved within 6 weeks of operation, it was clear that this complication could be avoided in future cases. This was later prevented by concentration on gentle dissection of the submuscular plane with the spatula dissector and more blunt dissection with the operator's index finger to minimize traction injury on the nerve.

Of the 3 major complications encountered, the one that was easily avoidable was that of seroma formation. After having had an uneventful surgery, a 50-year-old male patient presented to the office on postoperative day 5 with a large fluctuant area over the biceps region. The area was prepped with Betadine, and an 18-gauge needle was inserted to aspirate the seroma, with a total of 40–50 cc of return. When asked about his compliance with recommended compression garments, the patient admitted to rare use of the garments. He also admitted to being more vigorous in

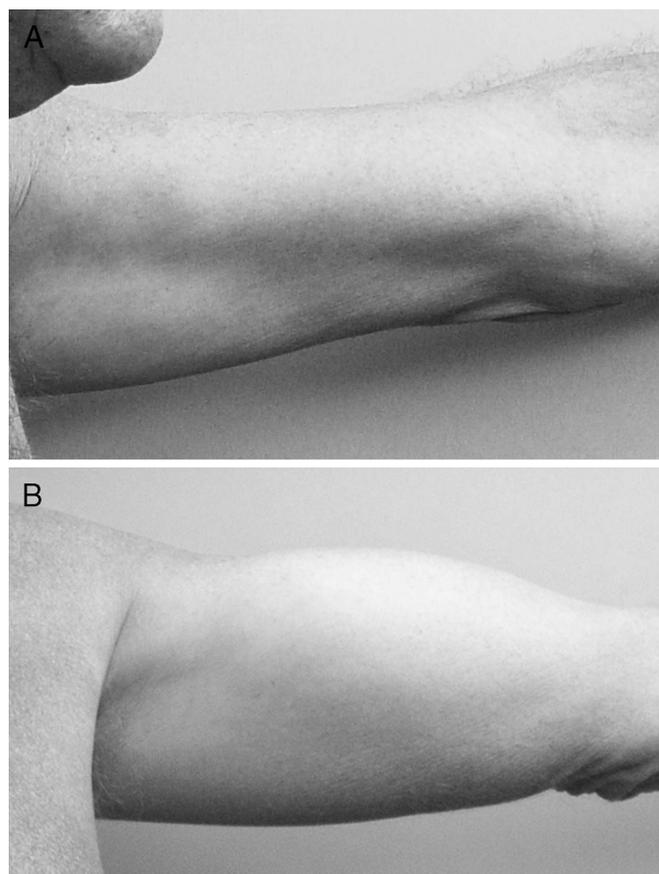


Figure 3. (A) Before bicep augmentation (patient 2).
(B) After bicep augmentation (patient 2).

his activities postoperatively than recommended in the standard postoperative instructions. Had he been more compliant with postoperative instructions given at the time of discharge, this complication could have been avoided.

Another complication encountered was an extrusion of an implant in a 23-year-old male patient. This patient was a professional bodybuilder and presented for initial consultation, requesting an extra inch of definition to his bicep. He had an uneventful operation and presented to the office 1–1.5 months postoperatively complaining of a noticeable protrusion around the site of his operation. On examination, the patient was noted to have the outline of the implant visible in the subcutaneous tissue. He was taken to the operating room for removal of the implant on the affected side without reconstruction or implant replacement. When asked about his activity level in the time postoperatively, the patient admitted to beginning his workout regimen in the third postoperative week,

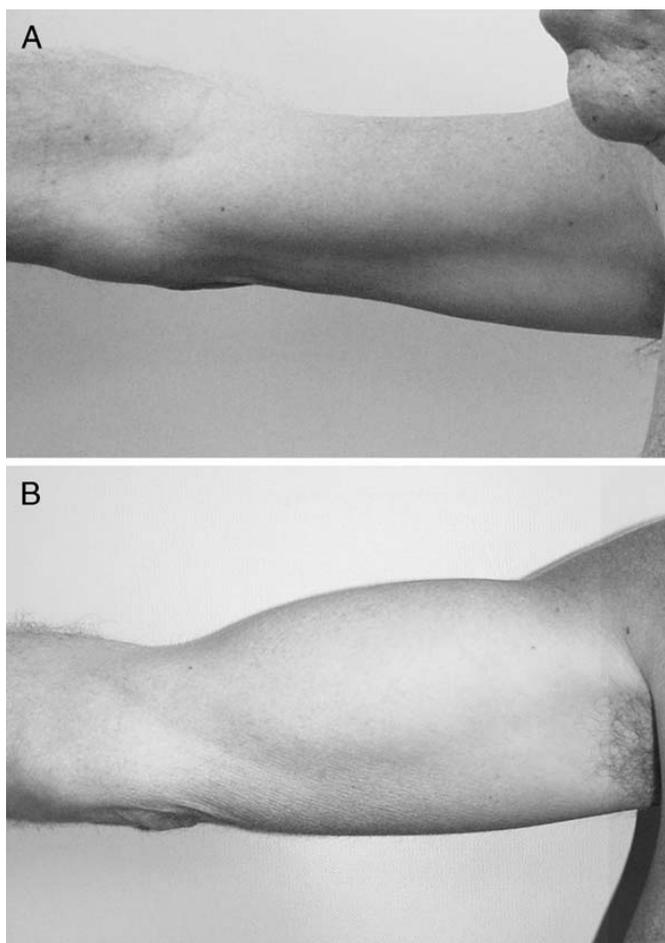


Figure 4. (A) Before bicep augmentation (patient 3).
(B) After bicep augmentation (patient 3).

demonstrating noncompliance with postoperative instructions.

The third and most devastating of complications encountered was that of a compartment syndrome in the upper extremity in a 38-year-old male patient. This patient initially presented for consultation to attain greater definition in his extremity as he had been born with a neuromuscular condition producing a frozen elbow in his left upper extremity. This produced a hypoplasia of his biceps and triceps muscles on the affected side that was not correctable with physical therapy and routine exercise. He underwent simultaneous biceps and triceps implantation, using the smallest implants that could be possibly constructed to achieve symmetry with the unaffected side. Four days postoperatively, the patient presented with pain in his left upper extremity that had been quite severe for the past day until he had an opening of his initial incision with serosanguineous drainage being

produced. On physical examination, he demonstrated a dusky appearance to the skin over the bicipital region with significant tension noted in the tissues of the area. Serosanguineous drainage was noted from his axillary incision site. He was taken to the operating room, where the initial incision was opened and dissection was carried down to the bicipital fascia. On opening the bicipital fascia, the tension in the bicipital region was relieved with serosanguineous drainage being expressed. The bicep implant was removed and the fascia closed again. The skin was closed, and the patient recovered without incident. He is scheduled for reconstruction of the bicipital region with fat filling in the near future (6 months after the development of his compartment syndrome).

Volkman, who first described the phenomenon of compartment syndrome, believed that the pathophysiology was related to massive venous stasis associated with simultaneous occurrence of arterial insufficiency.⁴ This in turn prevents proper circulation of blood to the muscles and nerves in a given compartment of an extremity, as tissue pressure increases. Nerve and muscle cells start to die within 4–8 hours. Compartment syndrome typically presents as a tensely swollen compartment with extreme pain, out of proportion to examination, on palpation. This is sometimes accompanied by referred pain to the affected compartment with passive stretch of muscles distal to the compartment. There may or may not be a neuropathy, typically described as a burning or prickling sensation, appreciated over the skin of the affected region. Finally, the patient may experience frank paralysis of muscles in the affected compartment. However, the patient who presents with this final finding has typically progressed beyond the point of muscle salvage. In our patient, it is clear that the placement of biceps and triceps implants in such a hypoplastic upper extremity may have been overzealous. Obviously, the addition of so much mass to the upper extremity and lack of room for stretch produced a potentially catastrophic situation in which the patient may have been at risk of losing the upper extremity. The surgeon, therefore, must be careful to not use overly large implants in the region, nor add too much bulk to the area without allowing room for adequate stretching of the compartment. In the future, patients who present for simultaneous augmentation of the triceps and biceps region may be best handled with a staged reconstruction, whereby one compartment is addressed at the initial operation and the

second compartment is augmented after a period of healing of at least 6 months.

Conclusions

Augmentation of the biceps region is an acceptable procedure for enhancing the male physique in patients who are unable to achieve the desired results from exercise and weight lifting. Although complications have been seen with the procedure, close patient follow-up, patient compliance with postoperative instructions, and meticulous closure can prevent most complications. The surgeon must be ever cognizant of the tension being created in the upper extremity to prevent disastrous complications such as compartment syndrome. Despite the occurrence of the complications noted above, we feel that bicipital augmentation is a relatively facile procedure that can be added to

one's armamentarium with the goal of meeting the needs of the male cosmetic surgical patient.

References

1. Chugay N, et al. Bicipital augmentation. *American Journal of Cosmetic Surgery*. 2006;23:33–36. 2, 3
2. Saint-Cyr M, Langstein H. Reconstruction of the Hand and Upper Extremity After Tumor Resection. *J Surg Oncol*. 2006;94:490–503.
3. Hodgkinson DJ. Contour restoration of the upper limb using solid silicone implants. *Aesthetic Plast Surg*. 2006;30:53–58.
4. Amendola A. Chapter 12: compartment syndromes. In: Browner, ed. *Skeletal Trauma: Basic Science, Management, and Reconstruction*. 3rd ed. City, ST: Publisher; 2003:00–00. 4

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