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BACKGROUND: Implantation of alloplastic materials has become the preferred method of primary chin augmentation.1 While silicone had been the most commonly used implant, newer porous materials including MedPor and Gore-Tex have seen growing application due to improved tissue ingrowth and fibrovascularization allowing for improved stabilization.2 However, there remains a paucity of literature comparing implant performance, complication profiles, and outcomes to determine the safest and most reliable implant material used for primary chin augmentations. Objectives: This review aims to provide evidence-based recommendations for preferred implant use in primary chin augmentation through systematic evaluation of the current literature.

METHODS: The PubMed database was queried on March 14, 2021. Primary selection criteria included all studies reporting data on patients who underwent alloplastic chin augmentation without any additional surgical chin procedures such as osseous or sliding genioplasty, fat grafting, autologous grafting, and adjunctive use of fillers. Complications reported included aesthetic dissatisfaction, malposition, infection, extrusion, revisions, and removal.

RESULTS: We evaluated 39 articles reviewing the use of alloplastic materials in primary chin augmentation, yielding > 3,104 patients, 12 categories of implant materials, and 4 categories of surgical techniques. Study designs included 31 retrospective case series, 5 retrospective cohort/comparative studies, 2 case reports and 1 prospective case series. The average ASPS level of evidence was 3.81 ± 0.76. The three implant materials with the largest study numbers were silicone (7), MedPor (16), and Gore-Tex (4). Among all reviewed implants, HTR polymer demonstrated the highest rate of total complications (11.1%, n = 27). Silicone implants had the largest sample size (n = 825) and demonstrated a significantly lower rate of aesthetic dissatisfaction (0.26%) compared to MedPor (n = 435; 1.9%, p < .01) and Gore-Tex (n = 387; 2.3%, p < .001). Gore-Tex, but not MedPor, demonstrated higher total complication rates (5.1%) compared to silicone implants (3.4%, p < .01); furthermore, there was no difference between Gore-Tex and MedPor. Other reviewed implants include Mersilene mesh, Proplast II, and polypropylene mesh, although analysis of these materials was limited by low statistical power. Genioplasties performed with supraperiosteal implantation showed the highest complication rate of 14.02% over 2 studies (107 patients). Subperiosteal implantations, the more commonly utilized surgical plane for implant placement, had a complication rate of 4.63% (26 studies, 2179 patients). A statistically significant difference was found between subperiosteal and supraperiosteal approaches (p < .0001). The surgical approach with the lowest complication rate was using an extraoral incision (2.5%, n = 1,118) compared to intraoral incision (3.96%, n = 1,011). The average length of follow-up was 43.9 months (range: 2 weeks to 15 years).

CONCLUSIONS: Overall complications for primary chin augmentation are very rare, and there are clinically insignificant differences in complication rates among the most commonly used implants such as silicone, MedPor, and Gore-Tex.3-5 This review suggests that equivalent patient satisfaction and outcomes can be achieved using any of these materials for alloplastic chin augmentation.

REFERENCES:
1. Gross EJ, Hamilton MM, Ackermann K, Perkins SW. Mersilene mesh chin augmentation. A 14-year experience. Archives of facial plastic surgery. 1999;1(3) doi:10.1001/ARCHFACI.1.3.183
2. Klawitter JJ, Bagwell JG, Weinstein AM, Sauer BW, Pruitt JR. An evaluation of bone growth into porous high density polyethylene. Journal of Biomedical Materials Research. 1976/3// 1976;10(2):311-323. doi:10.1002/JBM.820100212
3. Scaccia FJ, Allphin AL, Stepnick DW. Complications of Augmentation Mentoplasty: A Review of 11,095 Cases. http://dxdoiorg/101177/074880689301000306. 2016/11// 2016;10(3):189-195. doi:10.1177/074880689301000306
4. Chao JW, Lee JC, Chang MM, Kwan E. Alloplastic Augmentation of the Asian Face: A Review of 215 Patients. Aesthetic surgery journal. 2016/9// 2016;36(8):861-868. doi:10.1093/ASJ/SJW013
5. Mahler D. Chin augmentation--a resistrospective study. Annals of plastic surgery. 1982;86:468-473. doi:10.1097/00000637-198206000-00005

TRACK: RECONSTRUCTIVE
A Comparison of Direct Care at Military Medical Treatment Facilities With Purchased Care in Plastic Surgery Operative Volume

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BACKGROUND: Plastic surgeons have played an integral role in the care and recovery of casualties wounded in combat through complex wound management, craniofacial reconstruction, and regenerative medicine. Declining case volume and the subsequent lack of readiness for Department of Defense surgeons being immediately deployable has been an increasing concern over the last five years.1,2 Little is known about DoD plastic surgery case volume. The purpose of this study was to quantify the volume of plastic surgery cases performed at military treatment facilities (MTFs) and in direct and purchased care settings during fiscal years (FY) 2016-2019.

METHODS: A list of plastic surgery Common Procedure Terminology (CPT) codes was compiled to encompass common elective therapeutic (‘tracer’) and reconstructive (‘readiness’) surgery procedures. The Military Health System (MHS) Data Repository was queried from FY 2016-2019. A geospatial map was created to illustrate where each of these procedures were being performed and at what volume in relation to MTF and purchased care. Using these data, plastic surgery case volume was determined by Defense Health Agency (DHA) market.

RESULTS: From FY 2016-2019 a total of 85,191 cases meeting criteria were identified during this time period. Readiness cases comprised 31.6% (n=26,950) while tracer cases were 68% (n=58,241) of the cases performed. Overall, 83.2% (n=70,854) were purchased care. A total of 1,397 (1.6%) readiness cases were performed at the MTF’s, and 25,553 via purchased care (30%), while 12,940 tracer procedures (15.2%) were performed at the MTF’s, and 45,301 via purchased care (53.2%). San Antonio (n=223), San Diego (n=216), and the National Capital Region (n=122) had the highest volume of readiness cases over the four-year period.

CONCLUSION: As an overall trend, plastic surgery volume within MTFs has declined over the past several years. DHA MTF’s with high numbers of purchased care should be considered for the consolidation of plastic surgery resources and manning, and other strategies developed to recapture purchased care in the MHS. Like other surgical specialties, civilian partnerships would likely benefit plastic surgeons in preparation for combat deployments.3

REFERENCES:
1. Hall AB, Davis E, Vasquez M, et al. Current challenges in military trauma readiness: Insufficient relevant surgical case volumes in military treatment facilities. J Trauma Acute Care Surg. 2020 Dec;89(6):1054-1060.
2. Hall A, Qureshi I, Vasquez M, et al. Military deployment’s impact on the surgeon’s practice. J Trauma Acute Care Surg. 2021 Aug 1;91(2S Suppl 2):S261-S266.
3. Lee JJ, Hall AB, Carr MJ, MacDonald AG, Edson TD, Tadlock MD. Integrated Military and Civilian Partnerships are Necessary for Effective Trauma-Related Training and Skills Sustainment during the Inter-War Period. J Trauma Acute Care Surg. 2021 Nov 17.

TRACK: CRANIOMAXILLOFACIAL/HEAD AND NECK

A Retrospective Cohort Study of 5-Year Aesthetic Outcomes: Fronto-orbital Distraction Osteogenesis Versus Fronto-orbital Advancement & Remodeling

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INTRODUCTION: Unicoronal craniosynostosis (UCS) phenotypically presents with ipsilateral frontal and parietal bone flattening, supraorbital rim elevation and recession, temporal retrusion, palpebral fissure widening, and vertical orbital dystopia – known as the ‘harlequin deformity.’ Fronto-orbital advancement and remodeling (FOAR) is currently the most common surgical approach for UCS, although outcomes suggest high rates of ocular dysfunction, failure to achieve long-term aesthetic normalcy, and relapse over time. Fronto-orbital distraction osteogenesis (DO) is an alternative treatment for UCS, with literature suggesting improved anterior cranial base deviation, decreased perioperative morbidity, and lower rates of ocular dysmotility. This study compared long-term objective photogrammetric aesthetic and postoperative outcomes of patients with UCS treated with DO and FOAR.

METHODS: Patients presenting with non-syndromic UCS between 2007 and 2021 undergoing DO were compared to a matched cohort of patients undergoing FOAR. Clinical