A128 Cranial Feminization Surgery Methods and Osteological Identification of Post-Operative Individuals

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Learning Overview: After attending this presentation, attendees will understand skeletal alterations that manifest as part of cranial feminization surgery.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing details about cranial feminization surgery in general, and the resulting skeletal and soft tissue modifications specifically. Further, this presentation outlines the alterations that can be expected on the skull of post-operative individuals with variable healing (i.e., bone remodeling and modeling).

The number of transgender individuals in the United States has been estimated between 0.6%, or 1.4 million people, (through the Williams Institute in 2016) and 3% of the population, or 7 million people (by GLAAD in 2017). This group experiences high rates of violence, with 165 trans people murdered in the United States between 2008 and 2016.[1] Therefore, there is a growing need for the forensic community to be able to recognize the signs of cranial feminization surgery to facilitate a positive identification. Considering best practices for sex estimation in forensic anthropology specify observations of the pelvis and cranium, it is especially important for forensic anthropologists, and other individuals involved in constructing a biological profile, to be aware of the signs of surgical cranial feminization.

This presentation begins with a review of craniofacial surgical feminization techniques first developed in the 1980s. An examination is then provided of pre- and post-operative radiographs and Computed Tomography (CT) scans of 18 patients that underwent male-to-female cranial cosmetic surgery. Post-operative radiographs and CT images ranged in generation from 5 to 20 months following surgery. Four anatomical areas are identified on the skull that contribute to the accurate identification of post-operative individuals: (1) reduction of the glabella, (2) shortening of the nasal bones, (3) vertical reduction of the chin, and (4) alteration to the gonial angle (i.e., lateral flaring of the mandible).

In all patients, surgical alteration was made to these four anatomical areas of the skull to varying degrees. In 86% of cases, reduction of the glabella is achieved via osteotomy, in which the glabella is repositioned and the anterior wall of the frontal sinus reconstructed.[2] Most individuals in the sample (94%; 16/17) had at least a small area of anterior wall of the frontal grafted with steel wire. Nasal bone reduction was achieved through removal of the inferior nasal bone below a transverse incision and cartilage augmentation. Reduction of the chin height was achieved via osteotomy and fixation of a reduced mental eminence with titanium hardware in 94% (16/17) of the sample. Mandible alteration typically consisted of burring the outer cortical bone of the most lateral portions of the mandibular body. In 53% of the sample, the reduction resulted in exposure of the trabecular bone.

While the post-operative images range between 5 and 20 months and all patients have functionally healed, no images show complete remodeling of the bone. Patients of cranial feminization surgery continue to show ridges, or “bone scars,” on the frontal bone and mandible even after the bone is inactive. Because the remodeling process may never obliterate evidence of the skeletal procedures, the modifications could provide evidence to facilitate positive identification long after the surgeries were performed.

In addition to skeletal alterations, changes to the soft tissue were documented. These include feminization of the hairline, upper lip augmentation, and reduction of the thyroid cartilage. None of these surgeries were visible on the skeleton and would not necessarily aid in the identification of greatly decomposed individuals.

As these surgeries are increasingly practiced in the modern population, it is imperative that the forensic field can identify and appreciate signs of gender confirmation surgery in skeletal remains.

Reference(s):

1. Wirtz A.L., Poteat T.C., Malik M., Glass N. Gender-Based Violence Against Transgender People in the United States: A Call for Research and Programming. *Trauma, Violence, & Abuse.* 2018:1524838018757749.
2. Deschamps-Braly, J.C. Facial Gender Confirmation Surgery: Facial Feminization Surgery and Facial Masculinization Surgery. *Clinical Plastic Surgery* 45 (2018): 3323-331.

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