Potential Clinical Implications

First, if orthognathic surgery is to be considered, Syrian subjects with Class II/1 malocclusion might be considered more appropriate than similar Hungarians for bimaxillary advancement surgery and for reducing vertical dimension by surgical maxillary intrusion. Conversely, special consideration might be given to the final hyoid bone position after orthognathic surgery in Hungarian subjects. Second, if functional appliances are being used in Syrian subjects, it might be reasonable to design the mandibular repositioning to be more horizontal than vertical when compared with Hungarian subjects to prevent a negative effect on the pharyngeal airway due to a backward mandibular rotation.

Limitations

The use of lateral cephalogram as a two-dimensional representation of the three-dimensional airway structure can be considered a limitation of this study. Nevertheless, a recent systematic review and meta-analysis revealed that two-dimensional cephalometric analysis is a valid method to evaluate upper airway anatomy and influence treatment choices.[12] Furthermore, it was not possible to recruit and match patients based on strict criteria from 2 orthodontic centers in 2 different countries using a three-dimensional imaging method Cone-beam computed tomography (CBCT) due to ethical and technical considerations.

CONCLUSIONS

Syrian adolescents had a significantly smaller depth of the upper pharynx and larger soft palate angle than their Hungarian counterparts, and the hyoid bone was located more posteriorly in Hungarian adolescents.

An influence of skeletal restriction and vertical growth pattern on the upper and middle pharyngeal airway depths exists in Syrian adolescents, whereas no such associations were observed in Hungarian subjects.

The hyoid bone position and soft tissue morphology of the neck and chin regions influenced the lower pharyngeal airway depth only in Hungarian adolescents.

These findings might have potential implications for optimizing the effects of orthognathic/orthodontic treatments on airway structures in these 2 groups.

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Rarely Seen Intradiploic Skull Hematoma in Infants

Ümit Ali Malçok, MD and Ali Akar**

Abstract: Although the first intradiploic hematoma (IH) case was reported in 1934, only 7 infant cases were reported in the literature. The authors present 2 IH cases, without birth trauma or bleeding disorder, which were treated surgically. IH is also included in the differential diagnosis of babies with a skull deformity. Computed tomography and magnetic resonance imaging modalities should be used together in diagnosis and treatment. The authors believe that the surgery to treat skull deformity because of IH in babies should be planned in the early period.

Key Words: Infancy, intradiploic hematoma, skull deformity

Intradiploic hematoma (IH) is a hemorrhage that occurs between the skull bone's inner and outer layers. This rare condition can occur in the first year of life as well as in adulthood. According to the case reports in the literature, there are 17 cases, 7 of which are in the 0 to 1 year age range.[1–6] Although its etiology is not fully known, it has been reported to develop because of trauma, coagulation mechanism disorders, or after ventriculoperitoneal shunt surgery. Which are recognized by the enlargement of a region in the skull in infants, cephalohematomas are present in addition to subgaleal hematomas in the differential diagnosis of IH cases. Although cephalohematomas develop at a rate of 0.2% to 3.0% after birth and are limited to periost, subgaleal hematomas exceed these limits. Both hematomas are known to usually regress spontaneously within 4 to 6 weeks. However, surgical treatment has been reported for cephalohematomas that are calcified or that do not regress spontaneously.[7] Conversely, as spontaneous regression is not possible in IH cases, it is considered to be more appropriate to plan surgical treatment when the diagnosis is made.

Patients usually present with calvarial deformity. In the computed tomography (CT) imaging of these patients, the widening of

the diploe distance and calcification formation in the inner and outer layers are parameters that support the diagnosis. Among the treatment options, surgical methods are considered more beneficial aesthetically. It should also be noted that calvarial ossification increases with growth in infants, so the risks of surgical treatment increases accordingly. We aimed to present two IH cases without bleeding disorder and birth trauma, operated by us, and raise awareness about IH, which rarely develops.

CLINICAL STUDY

Ethical board approval was received with the (09.12.2020/2020-14) decision of Çanakkale Onsekiz Mart University, Faculty of Medicine, Ethical Board of Clinical Studies. The first case is an 18-week-old baby boy who presented with swelling on the right side of his head since birth. He was followed up with cephalohematoma diagnosis, but a calcified formation was observed in CT images after the swelling hardened. The patient's history found that the delivery took place at full term, without any strain or vacuum extraction. Furthermore, no neurological loss or bleeding disorder was detected. A subgaleally located 5×4 cm rigid immobile mass was observed in the physical examination of the right parietal region. A hypodense lesion of $5 \times 4 \times 3$ cm was found in the right parietal region intradiploic space in CT images (Fig. 1A). Magnetic resonance imaging showed hyperintensity in T1 and T2 sequences at the intradiploic space. These lesions did not affect the brain parenchyma (Fig. 1B). It was decided to correct the deformity by removing the lesion in the baby's skull. The galea was crossed through a right parietal "U" incision made around the swelling. Periost was found to be normal and was separated from the bone. A craniotomy was performed around the lesion, and the bone was removed with all its layers. The bone tissue was easily separated from the dura, which was intact. The inner and outer layers of the bone were separated. We decided to use the inner layer in the remodeling process because the outer layer had a severe deformation, and the inner layer was thicker. Remodeling was performed by reshaping the inner layer with a high-speed drill (Fig. 1C). In histopathological examination, bleeding foci and hypocellular bone distances were observed on the bone wall's surface facing the lumen (Fig. 1D-E). No complications occurred in the first postoperative weeks and 1-year period. The cranium form was found to be entirely satisfactory aesthetically, and the follow-up was terminated.

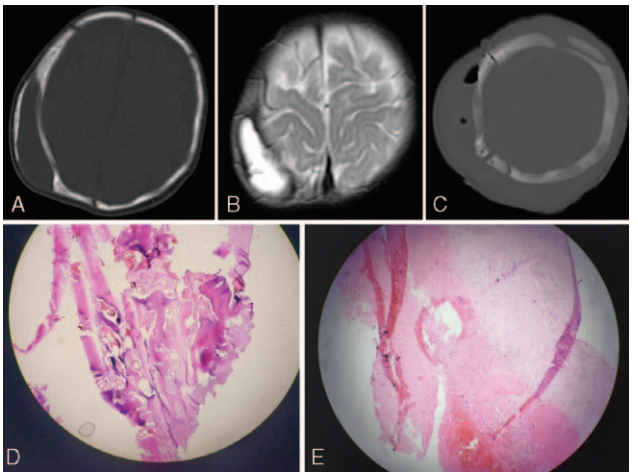

FIGURE 1. Radiological images. (A) Preoperative axial plane CT, bone window, (B) Preoperative axial plane T2 sequence MRI, (C) Postoperative axial plane CT, bone window, (D) Image of the histological slices belonging to the bone flap. H&E stained, (E) Granulation tissue and hemorrhage area. H&E stained. CT, computed tomography; MRI, magnetic resonance imaging.

The second case is a 55-day-old baby boy presented at our clinic with a complaint of swelling on the right side of his head. The swelling on the head was noted 15 days after birth, and it got bigger. It was found from the history of the patient that the delivery was at full term, by the usual vaginal route, and no vacuum was used. His neurological examination normal, and no bleeding disorder was detected. There was a lesion in the right parietal region in the CT with a vast diploe distance, hyperdense circumference but isodense in the middle (Fig. 2A). A solid, immobile mass of 4×3 cm was observed in the right parietal region (Fig. 2B and E). A hyperintense mass was observed in T1 and T2 sequences in the intradiploic space, and it did not affect the brain parenchyma (Fig. 2C). It was decided to correct the deformity by removing the lesion in the skull of the 55-day-old baby. Unlike Clinical Presentation 1, the outer layer of the bone structure forming the lesion was thicker, and it was used in the reconstruction. The bone flap was found to keep its flexibility, so it was reshaped by making a vertical incision in the midline, and the rebuilding was completed (Fig. 2D, F, and G). No complications occurred in the first postoperative weeks and 1-year period. The cranium form was found to be entirely satisfactory aesthetically, and the follow-up was terminated.

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We certify that all the data collected during the study is presented in this manuscript and no data from the study has been or will be published separately. We attest that, if requested by the editors, we will provide the data/information or will cooperate fully in obtaining and providing the data/information on which the manuscript is based, for examination by the editors or their assignees. We also certify that we have taken all necessary permissions from our institution and/or department for conducting and publishing the present work. There is no ethical problem or conflict of interest.

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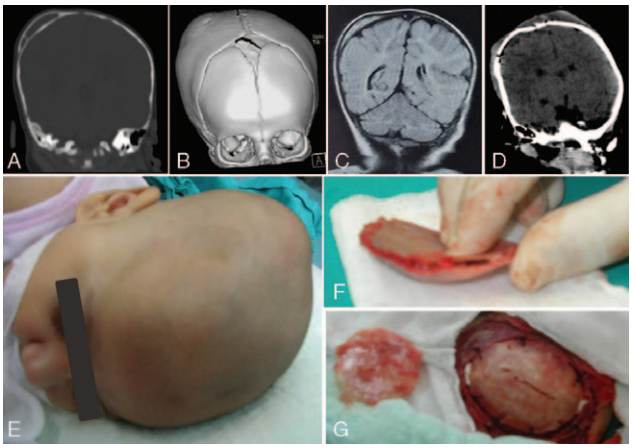

FIGURE 2. Radiological images. (A) Preoperative coronal plane CT, bone window, (B) Preoperative three-dimensional CT, (C) Preoperative coronal plane T1 sequence MRI, (D) Postoperative coronal plane CT, brain tissue window, (E) An asymmetrical skull swelling is seen in the right parietal region 4 × 3 cm in size, (F) Intradiploic area of the bone flap, (G) Bone flap placed after rebuilding by vertical incision and the removed inner layer. CT, computed tomography; MRI, magnetic resonance imaging.

DISCUSSION

Subcutaneous swelling in babies' head after birth is usually because of the caput succedaneum, cephalohematoma, or subgaleal hematoma. As the subgaleal hematoma and caput succedaneum are on the outside of the periost, it crosses the suture lines. Cephalohematomas, which are seen in 0.2% to 3.0% of babies and generally in the parietal region, are subperiosteal hemorrhages that are limited by the suture lines. These bleedings are usually resorbed within 4 to 6 weeks. Although the pathogenesis is not fully known, they can be calcified when the resorption is delayed. Surgical treatment is known to be preferred in cephalohematomas that develop calcification.[7] Cephalohematomas are usually distinguished from hard and immobile IH by their softness and crepitation on palpation. However, as ossification is not complete in newborns' skull bones, this hardness may not always be presented. Although IHs were previously named as interosseous hematomas, intradiploic non-neoplastic cysts, traumatic cysts, and recurrent giant cell granulomas, Sato and his friends defined these lesions as chronic IH in 1994.[8,9] Minor traumas are held responsible for the pathogenesis of chronic IHs. In the etiology of IH that develops in infants, there may be intrauterine traumas, birth traumas, bleeding disorders or there may be no definite cause at all. No history of trauma or bleeding disorder was found in either of our cases. Therefore, no clear etiology was detected as the cause of bleeding.

Three of the infant IH cases reported to date were normal vaginal births, 4 were difficult vaginal births, and all but 1 had male sex.[1–6] As there is no known difference in the skull bone and diploe distance of the male and female, this distribution might be accidental, according to the available information. Both of the cases we reported were male and vaginal births without trauma. When the hemorrhages in the reported cases are examined in terms of their anatomical location, the lesion is generally located in the frontal and parietal regions. One of the 7 cases reported in infancy was frontoparietal, 2 were in the left parietal, and the other 4 were in the right parietal region. Both of the patients we reported had IH in the right parietal region.

Surgical treatment was provided for all cases, with the exception of 1 case with factor VIII deficiency. We followed the surgical treatment method in the reshaping of the skull in both of our cases. The technique used in the reconstruction process of the operated cases varies according to the bone's tissue and the region that forms the lesion. The bone flap used in the reshaping of skull bone is formed by cutting the outer layer into a star shape or combining the outer and inner layers.[1–3] In our first case, the inner layer was used due to the outer layer being irregularly shaped. In the second case, we preferred to use the outer layer as a bone flap because the inner layer was thin. It seems more appropriate to decide the formation of the bone flap according to the deformity in the bone. In the differential diagnosis of babies presenting with a swelling on the head, IHs are commonly included as cephalohematomas. We recommend using CT and cranial magnetic resonance imaging modalities together in the differential diagnosis and surgical treatment of infant patients with IH. Since IHs do not regress spontaneously, aesthetic correction of the skull is only possible with surgical treatment. Depending on the type of skull deformity, different techniques might be used to shape the bone flap and reconstruct the skull.

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A Novel Technique of Negative Pressure Wound Therapy for Pharyngeal Cutaneous Fistulas Around Tracheostomas

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Abstract: Fistula formation after free jejunal transplantation is relatively common; however, treating esophago-jejunal anastomosis fistulas is difficult. Herein, the authors report a case of esophago-jejunal anastomosis fistula adjacent to the permanent tracheostoma after free jejunal transplantation that was closed using negative