ORIGINAL ARTICLE

The relationship between computed tomography findings and ocular trauma and pediatric ocular trauma scores in pediatric globe injuries: Does imaging have prognostic and diagnostic value?

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ABSTRACT

BACKGROUND: The aim of this study is to assess the relationship between computed tomography (CT) findings in open globe injuries (OGIs) in pediatric patients and the pediatric ocular trauma score (POTS) and OTS in pediatric ocular trauma.

METHODS: In 34 pediatric patients with OGI, CT findings were categorized into nine main categories: Scleral irregularity, lens dislocation, abnormal vitreous density, choroid-retinal layer thickening, preseptal thickness increase, intraocular foreign body and air, vitreous hemorrhage, retinal detachment, and perforation. The relationship between different types and numbers of CT findings and the POTS and OTS was evaluated.

RESULTS: The mean age of trauma was 6.6±3.1. Of the patients, 9 (26.5%) were female and 25 (73.5%) were male. The most common CT findings are scleral irregularity and increased preseptal thickness (47.1%). In univariate analysis, a P<0.05 was found between 16 patients with 1 or less CT findings (median POTS value 80 [71.25–90.0]) and 11 patients with 2 or 3 CT findings (median POTS value 60 [15–70]). A P<0.05 was found between 16 patients with 1 or less CT findings (median POTS value 80 [71.25–90.0]) and 7 patients with 4 or more CT findings (median POTS value 45 [25–80]). A P > 0.05 was found between 11 patients with 2 or 3 CT findings (median POTS value 60 [15–70]) and 7 patients with 4 or more CT findings (median POTS value 45 [25–80]). No significant difference was found between the number of CT findings and OTS stages. While POTS was significant (P<0.05) in patients with abnormal vitreous density (median 45 [30–69.6]), OTS value was not significant (P>0.05). There was no significant difference between POTS and OTS in other CT findings.

CONCLUSION: The number of CT findings may assist in predicting POTS and, consequently, estimating visual prognosis in pediatric patients with OGI. In emergency situations where, sufficient clinical data are unavailable, the objective findings from CT may help in assessing the severity of ocular trauma and potentially predicting long-term visual outcomes.

Keywords: Computed tomography; ocular trauma; pediatric ophthalmology; visual acuity.

INTRODUCTION

Ocular trauma in children is one of the most common avoidable causes of vision loss in children.[1] According to estimates, 1.6 million children worldwide are blind as a result of ocular trauma, with 2.3 million having bilateral and 19 million having unilateral poor vision.[2] The occurrence of ocular trauma varies greatly by nation, sex, age, and economic status.[3] Various studies have reported that eye injuries in childhood account

Cite this article as: Pirhan D, Subasi S, Kurt Musaoğlu B, Alparslan B, Karabaş L. The relationship between computed tomography findings and ocular trauma and pediatric ocular trauma scores in pediatric globe injuries: Does imaging have prognostic and diagnostic value? Ulus Travma Acil Cerrahi Derg 2023;29:1280-1287.

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Ulus Travma Acil Cerrahi Derg 2023;29(11):1280-1287 DOI: 10.14744/tjtes.2023.72470 Submitted: 07.09.2023 Revised: 27.09.2023 Accepted: 07.10.2023

for 12.5–33.7% of all admissions for eye injuries.[4] According to the American Academy of Pediatrics, 66% of all ocular traumas occur in those aged 16 and less, with the largest prevalence happening between the ages of 9 and 11.[5] Compared to adults, these traumas can cause amblyopia, which may lead to limitations in psychosocial development and social interaction, decreased awareness, loss of self-perception, and poor academic performance.[6]

The standardized classification of eye trauma is useful for ophthalmologists to categorize trauma, predict visual outcomes and develop prognostic, management, and prevention strategies.[7] Ocular trauma score (OTS) was developed as a set of standard language that is a worldwide, exact communication system as well as a system for identifying, quantifying, and predicting mechanical injuries.[8]

The OTS method predicts the final visual acuity (VA) based on the baseline VA, relative afferent pupillary defect (RAPD), globe rupture, endophthalmitis, a perforating injury, and retinal detachment (Table 1). Despite its widespread use and validation in several studies and across age groups, it might be challenging to assess VA and RAPD, two major OTS criteria, in children, especially in post-traumatic situations. Acar et al. created a pediatric OTS (POTS) in 2011 after evaluating 28 cases of pediatric ocular injuries.[9] This score limited the impact of VA as a predictive factor and proposed an alternate technique to estimate the visual result if initial VA was unavailable.

Imaging plays a key role in evaluating the severity of ocular and orbital trauma, making decisions, and planning treatment for ocular trauma.[10] Computed tomography (CT) scans are effective in detecting orbital and intraocular foreign bodies (IOFB), showing their locations, and providing intracranial and facial injury information.[10] CT scanning is easier to use in pediatric trauma patients and does not require patient cooperation.[11] Therefore, the majority of health-care services, including our own, perform a CT scan of orbita before the first repair of the injury. CT findings in traumatized eyes usually match clinical findings.[12] The accurate interpretation of CT scans in children can improve the early assessment of the final visual results for OTS and POTS.

Table 1. The ocular trauma score variables and raw points for calculating the ocular trauma score (Kuhn et al. 2002)

Variables	Raw point
Initial visual acuity	
No light perception	60
Light perception/hand motion	70
1/200–19/200	80
20/200–20/50	90
>20/40	100
Associated findings	
Globe rupture	−23
Endophthalmitis	−17
Perforation injury	−14
Retinal detachment	−11
Afferent pupillary defect	−10
Sum of raw points	OTS category
0–44	1
45–65	2
66–80	3
81–91	4
92–100	5

The objective of this research was to assess the correlation between CT findings and pediatric ocular POTS and OTS in open globe injuries (OGIs) in pediatric patients presenting at a pediatric ophthalmology emergency department in Türkiye. In this study, we present new information about CT results in a cohort of 34 children diagnosed with OGIs. Our objective was to investigate the potential correlation between scores of OTS and POTS, as well as the kind and amount of CT findings reported. The findings of this study could potentially contribute valuable knowledge toward the formulation of preventive measures and prognostic predictions for visual impairment in children as well as the type and quantity of CT abnormalities documented.

MATERIALS AND METHODS

A retrospective chart review was performed on consecutive pediatric OGIs presenting to the ophthalmology department of our university hospital from January 1, 2010, to December 31, 20. The study adhered to the tenets of the Declaration of Helsinki, and approval from the institutional research ethics board was obtained for the study.

A comprehensive analysis was conducted on the hospital records of all patients, including ophthalmological consultations, operation notes, and patient follow-up files. A data file was created to record the demographic information of patients, including age, gender, and laterality. The primary clinical assessment was determining the best-corrected VA (BCVA) at first presentation, assessing the existence or absence of a RAPD and red reflex, and evaluating ocular motility. Subsequent to these procedures, a biomicroscopic evaluation was conducted to evaluate potential impairments in the anterior segment, including subconjunctival hemorrhage, corneal or scleral laceration, hyphema, inflammation, irregular pupil, iris prolapse, lens subluxation, and cataract. In addition, an assessment was made for any damage to the posterior segment, which includes vitreous hemorrhage, retinal detachment, and choroidal hemorrhage. The item that caused trauma was also detected. The classification of ocular injuries was conducted in accordance with the Birmingham eye trauma terminology methodology.[13] The dataset also included the ultimate BCVA, the average duration from the occurrence of trauma to the admission of the patient, as well as any accompanying ocular observations, such as endophthalmitis. Moreover, it included information on any additional surgical procedures, the length of the follow-up period, and the condition of the eye at its latest appointment. The study comprised individuals who had been diagnosed with OGIs that were clinically or surgically proven, and who had also received orbital CT scanning for cranio- or orbito-facial reasons. The images were acquired using a 320-detector CT scanner (Aquilion ONE Model, Canon Medical Systems Corporation, Tochigi, Japan) by volumetric imaging with scan settings set at 120 kVP and 90 mA. The angle orientation of the segment was aligned parallel to the course of the optic nerve at the infraorbitomeatal plane. The CT images were then sent to the picture archiving and communication systems workstations, where the orbit was looked at using 3-D multiplanar reconstruction images with the right adjustments for bone and soft tissue. An experienced neuroradiologist (Dr. B.A.) evaluated all images using clinical information. Exclusion criteria were patients with insufficient clinical records, low-quality CT scans, pseudophakia, or aphakia.

The CT findings of 34 pediatric trauma patients who suffered OGIs were classified into nine main categories: Scleral irregularity, lens dislocation, abnormal vitreous density, chorioretinal layer thickening, increased preseptal thickness, presence of IOFB and air, vitreous hemorrhage, retinal detachment, and perforation. A univariate analysis was performed to evaluate the association between different kinds and amounts of CT findings and POTS and OTS values. The OTS and the POTS were computed for every individual in the study population. The score is a numerical representation ranging from 0 to 100, determined by giving a raw point value to the initial VA measurement and then deducting points based on the clinical observations. The first raw points for POTS are determined based on the initial VA, the age of the patient, and the location (zone) of the lesion (Table 2). In cases where VA measurement was unattainable, the subsequent calculation used the following formula: the sum of the patient's age and the site of the lesion, multiplied by two, with further deductions made based on the associated diseases.[9] The statistical analyses were performed using the SPSS for Windows, version 21.0 software application. The mean±standard deviation (SD) is used to represent continuous data, whereas percentages are used to represent categorical variables. A crosstab and Chi-square analysis were used to assess the relative frequency of distinct CT findings within OTS and POTS. The chi-square test was used to establish the associations between the quantity of CT findings and OTS and POTS. A significance level of <0.05 is considered statistically significant for the P-value.

Table 2. The pediatric ocular trauma score (POTS) variables and raw points (Acar et al., 2011)

Age	
6–10	15
11–15	25
Wound location	
Zone I	25
Zone II	15
Zone III	10
Concomitant eye pathologies	
Iris prolapse	−5
Hyphema	−5
Organic/unclean injury	−5
Delay in surgery (> 48)	−5
Traumatic cataract	−10
Vitreous hemorrhage	−20
Retinal detachment	−20
Endophthalmitis	−30
Sum of raw points	POTS category
<45	1
46–64	2
65–79	3
80–89	4
90–100	5

Table 3. The patients' demographics and injury characteristics

Variables	n	%
Gender		
Male	25	73.5
Female	9	26.5
Age (mean ± SD)	6.61±3.10	
Injured eye		
Right	11	32.4
Left	23	67.6
Type of open globe injury		
Laceration	2	5.9
Penetration	27	79.4
Perforation	4	11.8
IOFB	1	2.9
Trauma location		
Indoor	19	55.9
Outdoor	12	44.1
Missing	3	
Injury item		
Glass	5	15.6
Metal	1	3.1
Toy	1	3.1
Plastic	1	3.1
Wood	4	12.5
Pencil	1	3.1
Fall	1	3.1
Knife	6	18.8
Burr	1	3.1
Doorknob	1	3.1
Tree branch	1	3.1
İron bar	2	6.3
Screwdriver	1	3.1
Ruler	2	6.3
Fork	1	3.1
Needle	1	3.1
Stone	2	6.3
Missing	2	6.3
Wound size (mean ± SD)	6.69±4.40	

Table 4. The pattern of ocular injuries of the patients

Pattern of ocular injuries	n	Value (%)
Periorbital edema	1	2.9%
Corneal cut	11	32.4
Hyphema	1	2.9
Foreign body extending to the wound site	2	5.9
Intraocular foreign body	1	2.9
Traumatic cataract with membrane formation	1	2.9
Traumatic cataracts and corneal cut	7	20.6
Traumatic cataract, retinal detachment, and vitreous hemorrhage	1	2.9
Conjunctival cut, retinal detachment, and endophthalmitis	1	2.9
Traumatic cataract, corneal cut endophthalmitis	1	2.9
Scleral injury and commotion retina	1	2.9
Traumatic cataract, corneal cut, iris prolapse, vitreous hemorrhage, and hyphema	3	8.8
Traumatic cataract, corneal cut, intraocular foreign body, and retinal detachment	1	2.9
Traumatic cataract, corneal cut and iris prolapse	1	2.9
Traumatic cataract, retinal detachment, vitreous hemorrhage, corneal cut, and iris prolapse	1	2.9

RESULTS

In a comprehensive review, a total of 43 children with OGIs admitted to our clinic between 2010 and 2020. Following the exclusion of nine cases due to a lack of follow-up or incomplete records, as well as one case of chemical injury, 34 children met the inclusion criteria for our study. The demographics and injury characteristics of the patients are shown in Table 3. The mean ± SD of age was 6.61±3.10 years. 7 of 34 people were between the ages of 0–4 (20.6%), 15 of them were between the ages of 4–8 (44.1%), 8 of them were between the ages of 8–12 (23.5%), and 4 of them were between the ages of 12–18 (11.8%). There were 9 females (26.5%) and 25 males (73.5%) in the study, and the mean age was 6.61±3.10 (n=34). In all children, only one eye was injured (67.6% left eyes, n=23). The mean follow-up time was 2.89±0.77 years. The incident leading to trauma occurred most frequently at home (61.3%), and there were no chemical contacts in any injury; 19 were clean wounds (55.9%). All were mechanical injuries. None of the patients (98%) emerged after 48 h from the occurrence of ocular injuries, and surgical care was started for >95% of them within 6 h.

Table 4 presents the ocular injury patterns observed in the patients. The cornea emerged as the ocular structure most frequently affected by trauma. The most prevalent surgical indications were traumatic cataracts and corneal cuts (Table 4). Ocular surgery was carried out in all of patients as a result of trauma, with corneal cut repair being the mostly performed technique (n=11) (32.4%). Among eyes with an OGI, 2 had a full-thickness laceration (5.9%), 79.4% (n=27) had a penetrating injury, 7% (n=3) had a perforation, and 2.0% (n=1) had an IOFB (Table 4). In the study cohort, 52.9% of children (n=18) had a corneal laceration involving the visual axis in Zone 2 and Zone 3 scleral laceration was present in 35.2% (n=12) and 11.7% (n=4), respectively. The mean wound length was estimated to be 6.69±4.40 mm (n=34). The average value of POTS was found to be 63.05±25.74 (n=34), while the average value of OTS was determined to be 73.47±18.83 (n=23).

Table 5. Computerized tomography scan findings

	n	Value%
Type		
Scleral irregularity/globe collapse	16	47.1
Lens dislocation	4	11.8
Abnormal vitreous density	9	26.5
Chorioretinal layer thickening	5	14.7
Preseptal thickness	16	47.1
IOFB or air	9	26.5
Vitreous hemorrhage	7	20.6
Retinal detachment	1	2.9
Perforation	8	23.5
Number		
≤1 CT finding	16	47.1
2 or 3 CT finding	11	32.4
≥4 CT finding	7	20.6

CT: Computed tomography.

Table 6. Visual acuity of the patients with ocular injury at initial presentation and last follow-up

BCVA	At presentation (n)	At last follow-up (n)
NLP	1	2
LP/HM	7	3
1/10	5	1
2/10–4/10	3	3
≥5/10	7	22
N/A	11	3

BCVA: Best-corrected visual acuity; NLP: No light perception; LP: Light perception; HM: Hand motion; N/A: Non-applicable.

Table 7. Association between various types of CT findings and POTS, along with OTS scores in 34 study eyes

CT finding	POTSS (median±25–75 percentile)	P-value	OTS (median±25–75 percentile)	P-value
Scleral irregularity/globe collapse				
Absent	75 (63.75–82.50)	0.22	80 (68–90)	0.28
Present	67.50 (26.25–79.75)		65 (51–90)	
Lens dislocation				
Absent	75 (63.75–82.50)	NA	81.50 (59.50–90)	NA
Present	27.50 (17.50–45)		60 (37–N/A)	
Abnormal vitreous density				
Absent	75 (30–69.50)	0.03	83 (68–90)	0.08
Present	45 (30–69.50)		58 (43.75–82.50)	
Chorioretinal layer thickening				
Absent	70 (47.50–85)	0.47	70 (58–90)	NA
Present	50 (37.50–79.50)		63.50 (37–N/A)	
Preseptal thickness increase				
Absent	67.50 (33.75–80)	0.59	70 (59–90)	0.78
Present	74.50 (46.25–87.50)		83 (48–90)	
IOFB or air				
Absent	75 (62.50–85)	0.04	83 (70–90)	0.36
Present	50 (22.50–70)		58 (43.75–72)	
Vitreous hemorrhage				
Absent	75 (65–90)	0.16	83 (66–90)	
Present	50 (30–79)		51 (39.25–74)	
Retinal detachment				
Absent	70 (47.50–80)		70 (56–90)	
Present	30 (30–30)		N/A	
Perforation				
Absent	75 (65–90)	0.02	86.50 (70–90)	0.004
Present	32.50 (22.50–71.75)		56 (41.50–61)	
CT finding number				
≤1 CT finding	80 (71.25–90)	0.005	90 (70–92.50)	NA
2 or 3 CT findings	60 (15–70)		66 (55–81.50)	
≥4 CT findings	45 (30–79)		53 (39.25–82.50)	

NA: Not applicable N/A: Not available; CT: Computed tomography.

Table 5 presents the CT scan findings observed in the patients. The most common CT findings are scleral irregularity and increased preseptal thickness (n=16) (47.1%) (Table 5). Table 6 presents VA of the patients with ocular injury at initial presentation and last follow-up. Table 7 presents the association between various types of CT findings and POTS, along with OTS scores in 34 study eyes. The number of CT findings was grouped and compared according to their POTS and OTS. Since the number of patients with 4 or more CT findings in the OTS group decreased to 4, comparisons in terms of OTS could not be made. When the number of CT findings in terms of POTS was compared between groups, the difference was significant. When the groups were compared in terms of the number of CT findings, there was no significant difference between the group with 4 or more CT findings (median POTS value 45 [25–80]) and the group with 2 or 3 CT findings (median POTS value 60 [15–70]). A significant difference was observed between the group with 1 or fewer CT findings (median POTS value 80 [71.25–90.0]) and the group with 4 or more CT findings (P<0.05). There was a significant difference between the group with 2 or 3 CT findings and the group with 1 or fewer CT findings (P<0.05). As the number of CT findings increased, POTS gradually decreased indicating severe ocular trauma. While POTS was significant (P<0.05) in patients with abnormal vitreous density (median 45 [30–69.6]), OTS was not significant (P>0.05). There was no significant difference between POTS and OTS in other CT findings. A pairwise correlation analysis of CT findings and POTS is given in Table 8.

Table 8. Pairwise correlation analysis of computed tomography findings and pediatric ocular trauma scores (POTS)

Number	2 or 3 CT findings	≥4 CT findings
≤1 CT finding	P=0.016	P=0.034
2 or 3 CT findings		P=1

CT: Computed tomography.

DISCUSSION

Pediatric patients with trauma suspicious for OGI frequently have a limited ability to cooperate and examine due to pain, chemosis, or intraocular hemorrhage. CT scanning is frequently used as an adjunct in these circumstances. However, CT findings can be misleading. Here, we attempted to examine the predictivity of CT scanning for detecting OGI and characterize the associated findings. The primary aim of this study was to compare pediatric OGIs and their POTS and OTS outcomes and determine their correlation with CT findings. Results of our study indicate that young pediatric patients are most frequently aged <4–8 years (44.1%) when presenting to the emergency room with OGIs. These outcomes, which were consistent with earlier researches,[1,14-16] indicate that pre-schoolers spend more time at their houses and are consequently more likely to be injured inside. Hence, because of their susceptibility to amblyopia, these children experience the worst visual outcome.

The OTS and the POTS are the primary scoring systems used for predicting visual prognosis after open globe injury (OGI) in children. The OTS was established a decade ago to offer more reliable information on visual prognosis based on particular findings during the initial examination.[13] Recently, POTS was established to improve the reliability of prognosis for pediatric patients.[9] Predicting the visual result after ocular trauma is often challenging. Consequently, trauma scoring systems were devised to enhance the ability to estimate the visual consequences of such damage and provide a dependable prognosis for those responsible for the care of children. The accuracy and use of scoring systems, such as OTS and POTS, remain limited in the pediatric population, despite being considered acceptable. According to a recent study,[17] an alternative scoring system has been proposed as a more effective predictor of visual outcome in children following OGIs as an alternative to the existing scoring methods. The researchers' new score method did not consider the patient's age at the time of the injury, the presence of lens involvement, the type of injury (organic or undetermined), or any delays in surgical intervention as indicators of a poor visual outcome. The method is not yet widely used.

Imaging techniques play a crucial role in instances of ocular injuries when a full clinical assessment is unattainable and/or there exists a suspicion of an IOFB. The preferred diagnostic modality for assessing the extent and severity of acute eye injuries is orbital CT. Orbital CT scans give information about globe and orbital bone integrity and foreign body presence. When anterior segment details are clear, orbital CT is not useful as a clinical evaluation. When there are limitations in visual perception, ophthalmologists frequently encounter challenges in identifying an occult rupture. The findings of this study demonstrate that the utilization of a CT scan yields supplementary data that are valuable in the context of decision-making. The utilization of CT enables clinicians to visually assess the deformation or discontinuity of the globe wall and identify the presence of an IOFB. This imaging technique proves valuable in detecting ruptures that may not be readily apparent during a conventional clinical examination.

The CT results that indicate the presence of OGI include many features such as the presence of air inside the globe, the presence of a foreign body within it, abnormalities in the shape of the globe, or irregularities in the sclera. The presence of intraocular air and foreign bodies (IOFBs) are diagnostic indicators that strongly suggest OGI in eyes that have recently experienced trauma.[18]

In their study, Joseph et al.[19] identified scleral contour changes (75–95%), anterior chamber changes (48–86%), and lens position changes (65–83%) as the prevailing observations in cases of open-globe injuries. Similarly, Arey et al.[20] reported that vitreous hemorrhage (82%) was the most frequently observed finding in their investigation of patients with occult trauma. Scleral irregularity was found to be the predominant radiographic feature in our study, followed by preseptal thickness, abnormal vitreous density, and IOFB or air. While Joseph et al. documented vitreous hemorrhage in a range of 52–67% in their cases[19] (which was lower than the findings by Arey et al.)[20] our study revealed a vitreous hemorrhage incidence of 14.9% among the pediatric group. The lower vitreous hemorrhage rate observed in our research can be attributed to the fact that 20.6% of our cases exhibited solely corneal cuts, while 32.4% presented with conjunctival or corneal cuts. Moreover, the reduced incidence of vitreous bleeding after traumatic events, as shown by CT scans in the eyes of children, might be attributed to the presence of an intact vitreous gel that remains in a non-liquefied state. In addition, the tight adherence of the posterior vitreous cortex to the internal limiting membrane of the retina further contributes to this phenomenon. Vitreous syneresis and liquefaction are not seen in pediatric populations. The prevention of collagen fibril adhesion to one another in the vitreous is attributed to the presence of collagen type IX, which forms a protective layer on the external surface of type II collagen.[21] This phenomenon might potentially contribute to the development of a firmly adherent vitreoretinal interface.

Abnormal vitreous density statistically correlated with both POTS and OTS (P=0.03 and P=0.08, respectively). Since vitreous opacities are rare in children, the observed effect can be explained by a greater risk of post-traumatic densities. IOFB and/or air presence has a significant association with POTS but not OTS in our study group. Due to the limited patient population, the occurrence of this phenomenon cannot be expected or considered probable. In addition, it should be remembered that organic foreign bodies are less likely to appear on CT. Furthermore, even one CT finding in our study patients statistically correlated with POTS but not in OTS group. In circumstances where vision cannot be obtained, CT findings can be used to estimate the prognosis using the score formula. This necessitates large-scale investigations with planned long-term follow-up for a large number of patients.

The limitations of our study derive from its retrospective design. To evaluate the accuracy of the imaging-based diagnosis, however, the included cases were those requiring primary repair and were confirmed and followed-up clinical cases. Furthermore, not all patients' information was always available, causing the sample size to vary. Since the original study group consisted of a limited number of participants, we were unable to employ a logistic regression model for the anticipation of an unfavorable visual result, and we could not use a univariable analysis or the unadjusted odds ratio to create a prognostic score scale. Although our case series contains a brief 2-year follow-up time across an 18-year age OGI, we recognize that the report's shortcoming is the study's retrospective and non-randomized character. Furthermore, treatment selection bias may alter the findings. This study also includes a substantial number of cases with various injury mechanisms. This makes our study an important contribution to the literature on the use of orbital CT to determine the condition of the globe in at least one eye.

There is a consensus that CT scans serve as an adjunct to clinical findings rather than as an alternative for them. While the findings of our study indicate that CT scans may provide dependable information, it is important to note that they should not be the primary basis for diagnosis in all cases with open-globe injuries. A CT scan might not always show the presence of a foreign body or air; an open-globe injury may still exist. However, within the given scenario, CT imaging proves to be extremely advantageous.

When clinical information is not available, studies have found that CT imaging has a sensitivity of 75% and a specificity of 93% in predicting open-globe injury[18] Existing literature reviews indicate a consensus about the use of CT scanning as the preferred imaging modality in the majority of trauma patients.[22]

In children with OGI, the POTS stage and visual prognosis may be predicted by the quantity and type of CT findings. The number of CT findings can help predict POTS stage, and therefore, visual prognosis in pediatric patients with OGIs.

To the best of our knowledge, this is the first study to look at the correlation between CT results and OTS and POTS in children. Although both OTS and POTS are acceptable ocular trauma staging methods, collecting the data needed to calculate the score can be problematic, especially in situations involving children. Because CT scans may be easily obtained regardless of the patient's cooperation or systemic condition, they can assist forecast the severity of ocular injuries and possibly the long-term visual result in emergency cases where good clinical data is not available. This data would allow for a direct link between early CT findings and long-term vision outcomes.

CONCLUSION

In pediatric patients with OGIs, the frequency of CT findings can assist in predicting POTS stage and thus visual prognosis. When enough clinical data are unavailable in an emergency, objective finding from CT can assist in predicting the degree of ocular injuries and possibly the long-term visual outcome. In addition, more research is required to define and standardize a CT-based grading system that is as accurate as POTS staging for OGIs in children.

Ethics Committee Approval: This study was approved by the Kocaeli University, School of Medicine Ethics Committee (Date: 07.09.2023, Decision No: KÜ GOKAEK-2023/14.20).

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: D.P.; Design: D.P., B.A.; Supervision: D.P., B.A.; Resource: D.P.; Materials: D.P., B.K.M., S.S.; Data collection and/or processing: D.P., B.K.M., S.S.; Analysis and/or interpretation: D.P., S.S., L.K.; Literature search: D.P., B.A., B.K.M.; Writing: D.P., K.M.; Critical review: L.K.

Conflict of Interest: None declared.

Financial Disclosure: The author declared that this study has received no financial support.

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ORİJİNAL ÇALIŞMA - *ÖZ*

Pediatrik glob yaralanmalarında bilgisayarlı tomografi bulguları ile oküler travma ve pediatrik oküler travma skorları arasındaki ilişki: görüntülemenin prognostik ve tanısal değeri var mı?

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AMAÇ: Bu çalışmanın amacı, pediatrik hastalarda açık glob yaralanmalarında bilgisayarlı tomografi (BT) bulguları ile pediatrik oküler travma skoru (POTS) ve oküler travma skoru (OTS) arasındaki ilişkiyi değerlendirmektir.
GEREÇ VE YÖNTEM: Açık glob yaralanması (AGY) olan 34 pediatrik hastada BT bulguları 9 ana kategoriye ayrıldı: Skleral irregularite, lens dislokasyonu, anormal vitreus dansitesi, koryoretinal tabaka kalınlaşması, preseptal kalınlık artışı, intraoküler yabancı cisim ve hava, vitreus hemorajisi, retina dekolmanı ve perforasyon. Farklı tip ve sayıdaki BT bulguları ile POTS ve OTS arasındaki ilişki değerlendirildi.
BULGULAR: Ortalama travma yaşı 6.6±3.1 idi. Hastaların 9'u kadın (%26.5) 25'i (%73.5) erkekti. En yaygın BT bulguları skleral irregülarite ve preseptal kalınlık artışıdır (%47.1). Çok değişkenli analizde 1 veya daha az BT bulgusu olan 16 hasta (median POTS değeri 80 (71.25-90.0)) ile 2 ya da 3 BT bulgusu olan 11 hasta (median POTS değeri 60 (15-70)) arasında p değeri <0.05 bulundu. 1 veya daha az BT bulgusu olan 16 hasta (median POTS değeri 80 (71.25-90.0)) ile 4 veya daha fazla BT bulgusu olan 7 hasta (median POTS değeri 45 (25-80)) arasında p değeri <0.05 bulundu. 2 ya da 3 BT bulgusu olan 11 hasta (median POTS değeri 60 (15-70)) ile 4 veya daha fazla BT bulgusu olan 7 hasta (median POTS değeri 45 (25-80)) arasında p değeri>0.05 bulundu. BT bulgu sayısı ile OTS evreleri arasında anlamlı farklılık bulunamadı. Anormal vitreus dansitesi var olan hastalarda (median 45 (30-69.6)) POTS anlamlı iken (p<0.05) OTS değeri anlamlı bulunmadı (p>0.05). Diğer BT bulgularında ise POTS ve OTS arasında anlamlı fark bulunmadı.
SONUÇ: BT bulgularının sayısı, AGY olan pediatrik hastalarda POTS skorunu öngörmede ve dolayısıyla görsel prognozu tahmin etmeye yardımcı olabilir. Yeterli klinik verilerin bulunmadığı acil durumlarda, BT'nin objektif bulguları oküler travmanın ciddiyetini ve muhtemelen uzun vadeli görsel sonucunu tahmin etmeye yardımcı olacaktır.

Anahtar sözcükler: Bilgisayarlı tomografi; görme keskinliği; oküler travma; pediatrik oftalmoloji.

Ulus Travma Acil Cerrahi Derg 2023;29(11):1280-1287 DOI: 10.14744/tjtes.2023.72470