Erratum

Erratum to: Development, Validation, and Application of a Parametric Pediatric Head Finite Element Model for Impact Simulations

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This erratum is to correct for a gantry tilt effect that was not considered in the CT image processing in the original publication. Figures 3–8, 10–12, and Table 2 have been updated to reflect the geometry changes of the pediatric heads in both the CT segmentation results and the parametric FE model. The *p*-values of material and geometry factors in the parametric study in Fig. 6 changed slightly from the original publication, but these changes did not affect statistical significance. After correction, on average, the model of the 3-month-old head still predicted higher maximal principal stress and strain in the suture than the model of the

newborn head, but this age effect dropped from 64.8 to 32.0% for the stress and from 66.3 to 51.1% for the strain. Similarly, after correction, the model of the 3-month-old head still predicted lower maximal principal stress and strain in the skull than the model of the newborn head, but the age effect changed from –25.7 to –35.5% for the stress and from –11.5 to –6.2% for the strain. The optimal material parameters shown in Table 2 also changed slightly from the original publication. In particular, the optimal elastic moduli of skull, suture, dura, and scalp were 164.3, 15.8, 17.3, and 8.5 MPa, respectively, after correction.

The major findings and conclusions of this paper are not affected by these differences. The corrected version of Figs. 3–8, 10–12, and Table 2 are presented here.

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FIGURE 3. Landmarks, baseline FE model, and CT segmentation.

Red point: 3-month-old; Blue point: 1.5-month-old; Black point: Newborn

FIGURE 4. Predicted landmark spatial locations for half of the pediatric heads at three ages (unit: mm).

FIGURE 5. Morphing results from baseline model to three targets.

FIGURE 6. Response measurements with respect to all factors.

FIGURE 7. Drop test conditions.

FIGURE 8. Compression test setup with moving plate at the anterior boundary and the posterior skull fixed.

FIGURE 10. History of sum of acceleration errors in eight drop conditions in the optimization.

FIGURE 11. Optimization results under different drop conditions.

FIGURE 12. Test and simulation comparison in compression condition.

TABLE 2. Material properties used in the infant head FE models.

Parameters	Young's modulus (MPa)	Poisson's ratio	Density (kg/m ³)	Note
Skull	164.3	0.22	2150	Optimization determined
Suture	15.8	0.49	1130	
Dura	17.3	0.45	1140	
Scalp	8.5	0.42	1200	
CSF	0.012	0.499	1040	From literature
Brain	$K = 2.11 \text{ GPa}, G(t) = G_{\infty} + (G_0 - G_{\infty})e^{-\beta t}$ $G_0 = 5.99 \text{ kPa}, G_{\infty} = 2.32 \text{ kPa}, \beta = 35/\text{s}$		1040	