

Computed Tomography Analysis Of Mandibular Asymmetry Progression In Patients With Unilateral Craniofacial Microsomia

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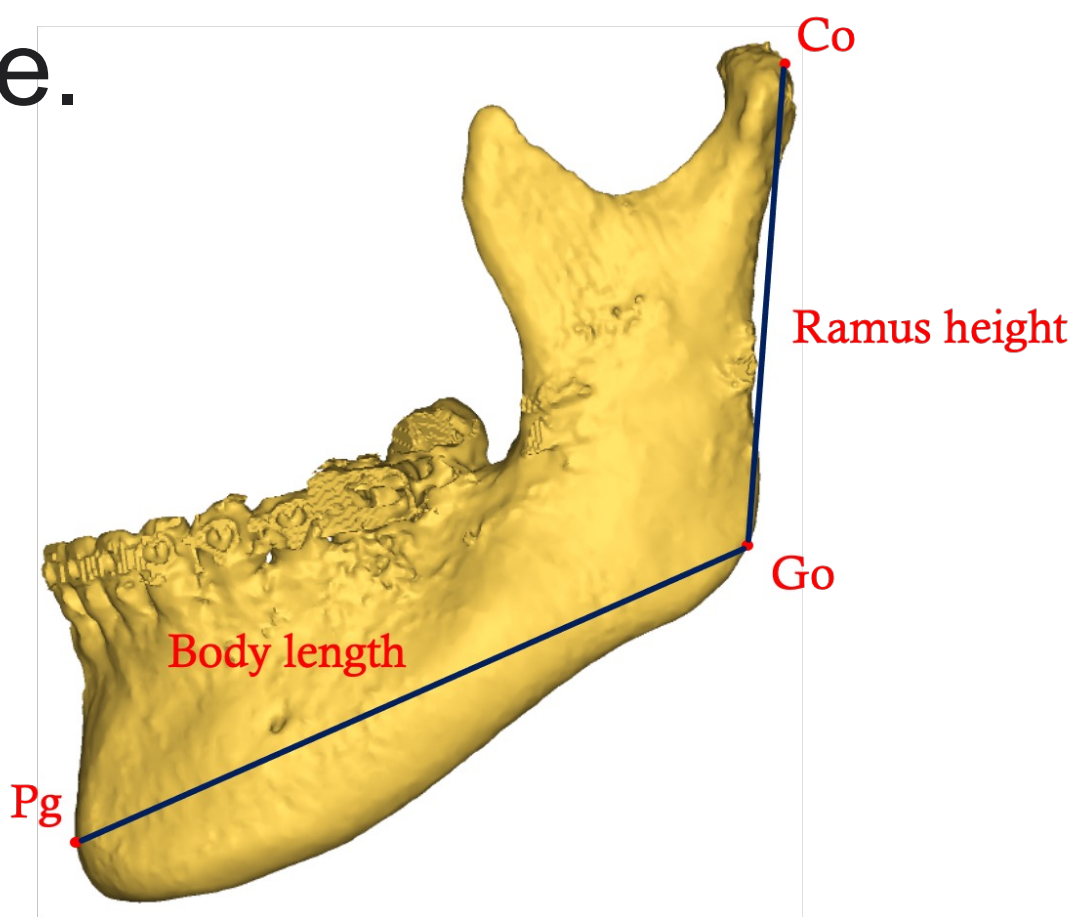
Purpose

- Different levels of mandibular hypoplasia and/or deformity observed between the two halves of the mandible in craniofacial microsomia (CFM) result in mandibular asymmetry.
- The purpose of this study is to determine whether the mandibular asymmetry in CFM is progressive or static.
- The study also aims to evaluate whether the progressive nature of mandibular asymmetry varies with the Pruzansky classification of the degree of mandibular severity.

Methods

- Medical charts of patients with unilateral CFM seen between 2009-2022 before undergoing mandibular surgery were reviewed and available CT scans were collected.
- CT scan mandibular 3D reconstruction was conducted in Materialize MIMICS software (v 24.0).
- Mandibular body length and ramus height were measured for the affected and unaffected sides at each CT scan time point.
- The measurements of the affected side were compared against the average growth curve of the unaffected side.

Figure 1: Measurement of the the mandibular ramus height (Co-Go distance) and the mandibular body length (Go-Pg distance) using a landmark based approach



Results

Table 1: Characteristics of patients included in the study

Number of Patients	29
Age range of CT scan time points (years)	5 – 24
Pruzansky Class	
I	5
IIA	14
IIB	9
III	1

Figure 2: Mandibular body length and ramus height growth curves for Pruzansky type I mandibles with mean growth rates

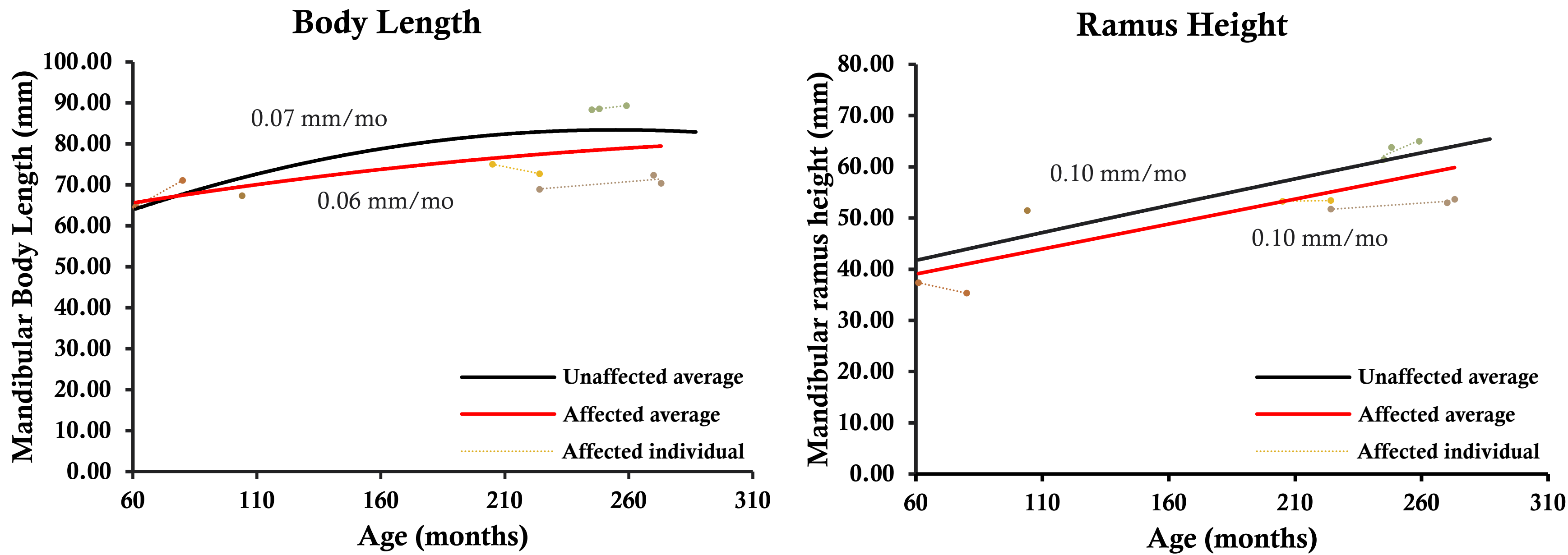


Figure 3: Mandibular body length and ramus height growth curves for Pruzansky type IIa mandibles with mean growth rates

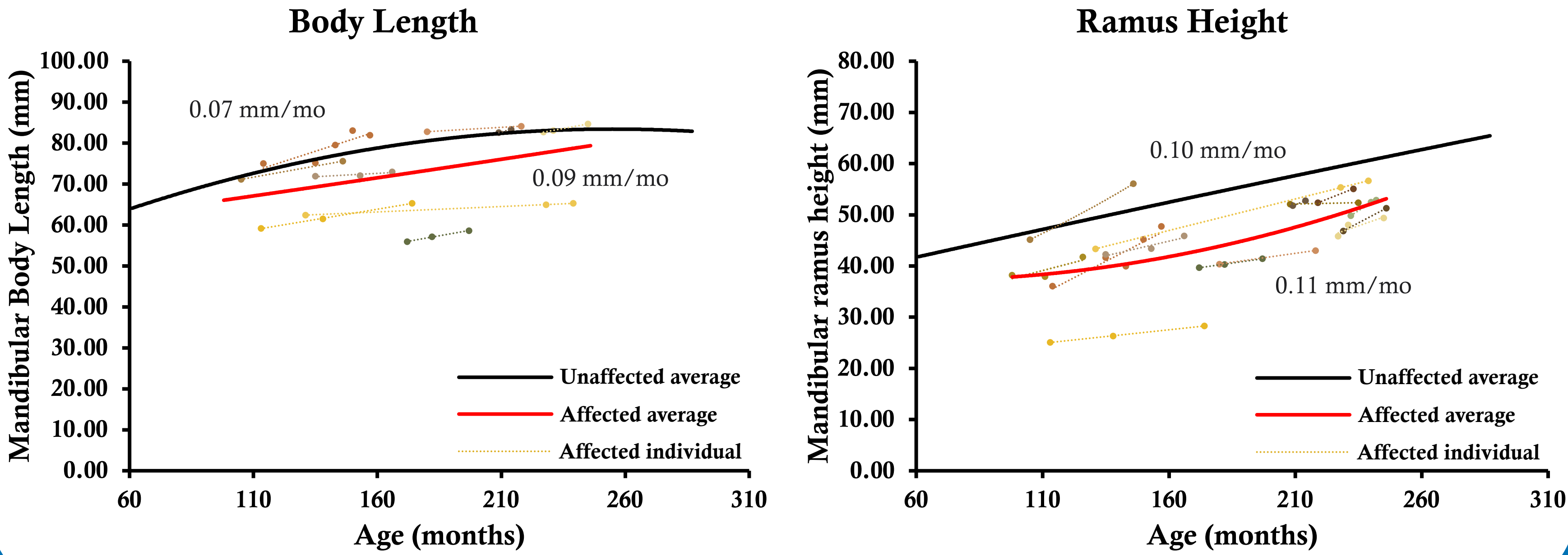
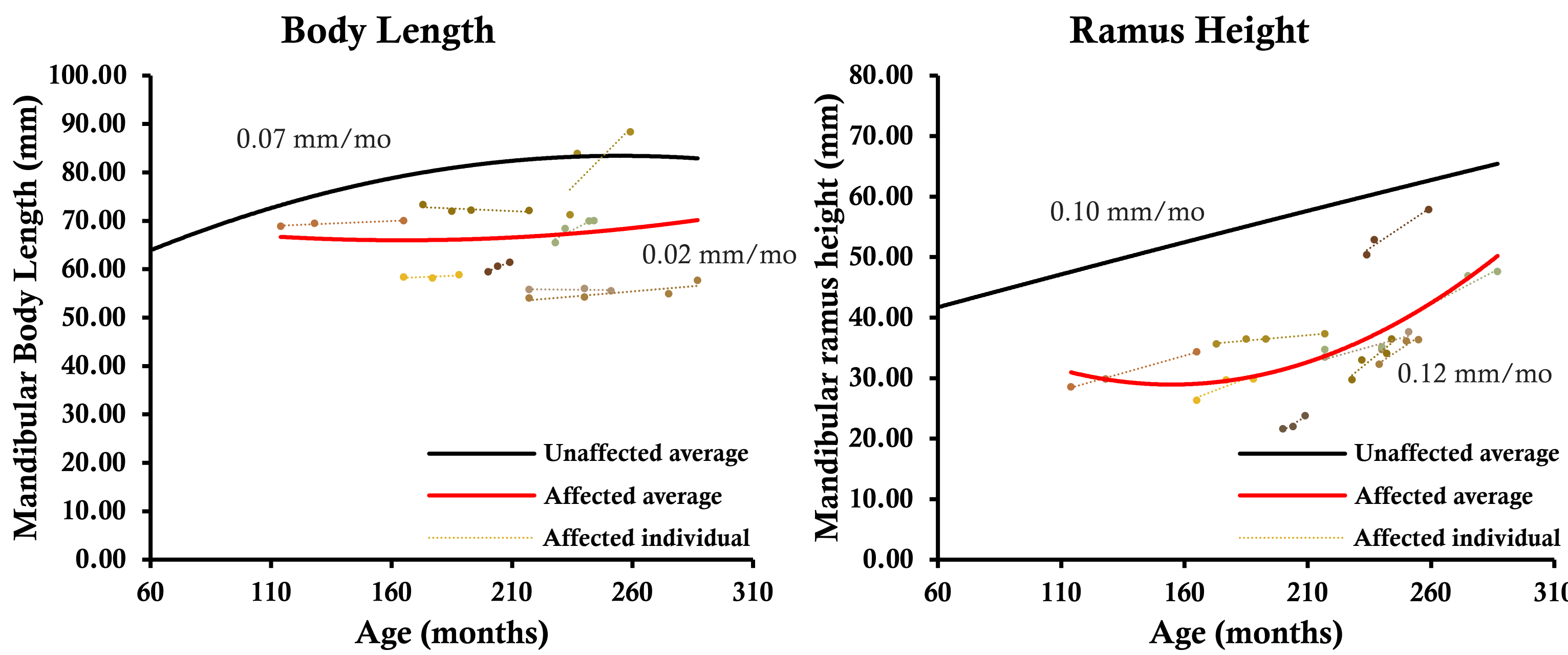


Figure 4: Mandibular body length and ramus height growth curves for Pruzansky type IIb mandibles with mean growth rates



Conclusions

- Mandibular body length and ramus height growth pattern is similar between the affected and unaffected sides for Pruzansky type I and IIa mandibles.
- Mandibular body length growth for the affected side reaches a plateau earlier in Pruzansky type IIb mandibles.
- Mandibular ramus height growth rate for the affected side in Pruzansky type IIb mandibles is initially slower than the unaffected side but starts increasing after 210 months.
- Mandibular asymmetry in unilateral CFM appears to be static in Pruzansky type I and IIa mandibles and progressive in type IIb mandibles.