

Periodontal Ligament Visibility (PLV): a reliable Mandibular Maturity Marker (MMM) to determine a subject's status at the 18-year threshold

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ORAL PRESENTATION

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ABSTRACT

Introduction: Gradual obliteration of the radiographic appearance of the periodontal ligament of lower third molars, indicating an age above 18 years was first published in 2010 (Olze et al.) This was tested on 2,000 subjects to provide a Reference Data Set for UK Caucasians.² The concordance of the results from these two studies led to introduction of the PLV assessment for forensic age estimation in the UK. It was deemed appropriate to re-assess the Dental Age Estimation (DAE) cases carried out by the DARLInG team in London.

Materials and Methods: DAE legal cases from 2005 to 2015 were re-examined. PLV assessment was used to assign subjects above or below the 18-year threshold. As follows:

1. Presence of Demirjian Stage H for LL8 (FDI 38). If the LL8 was absent the LR8 was used as an alternate.
2. Then, PLV was assessed using the combined criteria (Lucas et al 2016)

Results: From the total of 410 forensic age assessments there were 191 subjects with tooth 38 (or 48), at Stage H. The following probabilities were derived for both genders.

The probabilities of a subject being over 18 years using PLV are shown in the table. For both female and male subjects with PLV- C and PLV- D the probability of being over 18 years is 1.000 [100%]

Discussion: The presence of PLV- C and PLV- D is a clear indicator that the subject is over 18 years old. For RPV- A, and RPV- B there is a small chance that the subject is under 18 years old. The MMM are limited to subjects for whom the LL8 (or LR8) are present on the Dental Panoramic Tomograph.

Conclusion: The presence of PLV- C and PLV-D for both females and males indicates a 100% probability that the subjects exhibiting this feature are over 18 years old.

Females	(years)	sd	p > 18 years	%-age > 18 years	n - tds for RPV
					Stages in females
PLV- Af	19.57	1.83	858	85.8	4
PLV- Bf	21.25	2.16	841	84.1	22
PLV- Cf	22.96	1.95	1.000	100.0	9
RLV- Df	23.86	1.79	1.000	100.0	1
Males	(years)	sd	p > 18 years	%-age > 18 years	n - tds for RPV
					Stages in males
PLV- Am	20.32	1.61	910	91.0	40
PLV- Bm	21.17	2.13	974	97.4	87
PLV- Cm	22.49	2.11	1.000	100.0	26
RLV- Dm	23.37	1.85	1.000	100.0	2

References

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2. Lucas VS, McDonald F, Andiappan M, Roberts G. Dental age estimation: periodontal ligament visibility (PLV) – pattern recognition of a conclusive mandibular maturity marker related to the lower left third molar at the 18 year threshold. *International Journal of Legal Medicine*. 2016 doi 10.1007/s00414-016-1468-3
3. www.dentalage.co.uk see section Reference Data Sets.