



A Comparative Analysis of Dental Structures in Mono-zygotic and Dizygotic Twins: Implications for Identifying Twins in Forensic Sciences



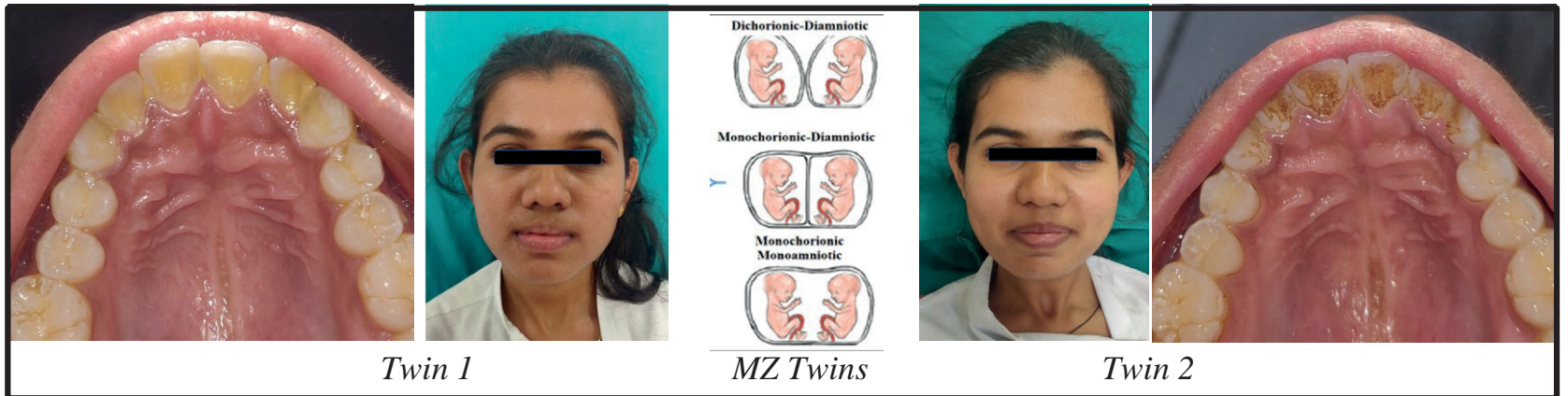
Dr. Saahil Ramesh¹, Dr. Praveenkumar Ramdurg²

¹ Postgraduate student- Department of Oral Medicine & Radiology

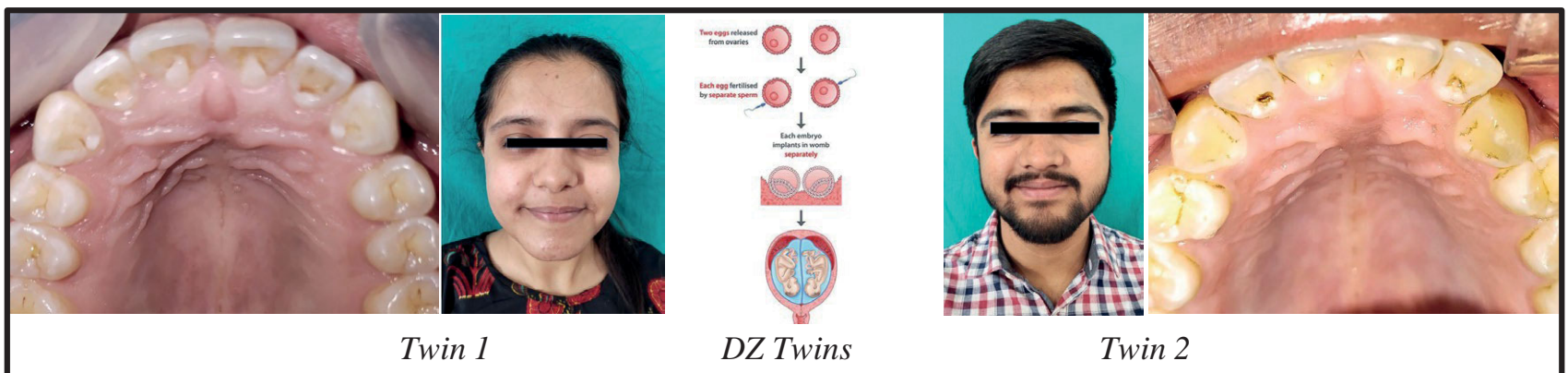
² Professor, Department of Oral Medicine & Radiology,

P.M.Nadagouda Memorial Dental College, Bagalkot, Karnataka.

Introduction: Monozygotic (MZ) twins, known as identical twins, originate from the same fertilized ovum, and by the virtue of which share the same DNA, placenta, amniotic fluid, and physical features. Dizygotic (DZ) twins are formed when two sperms fertilize two eggs separately, and they do not share the same DNA. Palatal rugae have been considered equivalent to fingerprints, as they are unique to each individual. Exploring the degree of resemblance in tooth morphometry and the pattern of rugae and various mandibular measurements on orthopantograph (OPG) among twins shall aid in forensic identification.



Material & Methodology: One pair each of MZ and DZ Twins were selected whose dental impressions were taken. The maximum coronal mesio-distal and bucco-palatal dimension of the maxillary teeth, excluding the second and third molars, were measured using digital vernier calipers for tooth morphometry. Palatal rugae patterns of the samples were cast, analyzed, traced and recorded based on shape and unification. Both the pairs were subjected to OPG and mandibular measurements like maximum ramus breadth, minimum ramus breadth, projective ramus height, bi-gonial width, antegonial depth, gonial angle and antegonial angle were measured for both the twin groups.



Max RB (mm)	Min RB (mm)	Proj RH (mm)	Bigonial Width (mm)	Antegonia I Depth (mm)	Gonial Angle (Degrees)	Antegonial Angle (Degrees)	Subjects
34.6	26.9	63.8	153.7	2.3	114.89	162.23	MZ-Twin 1
37.8	30.3	60.6	169.9	2	113.42	153.72	MZ-Twin 2
40.2	34.7	65.2	167.8	1.8	123.34	168.01	DZ-Twin 1
35.2	30	68.5	173.2	2.5	118.01	153.25	DZ-Twin 2

Results & Conclusion: The results revealed significant differences in tooth morphometry and palatal rugae pattern between the mono-zygotic and dizygotic twins. The OPG parameters also showed minor differences between the two groups of twins. The palatal rugae pattern among both showed a mirror-image effect. Genetic and environmental factors play a role in the development of these structures, and palatal rugae can be a reliable tool in studying dental and cranio-facial structures in twins.

References: 1.) Lestari W, Adanan NA, Mokhtar NI, Ardini YD, Ichwan SJ, Haris MS. Tooth Morphometry and Pattern of Palatal Rugae Among Monozygotic Twins in Malaysia. J Orofac Sci 2021;13:39-46
 2.) Panda S, Sahoo A, Mohanty N, Sahoo SR, Subramaniam R. Tooth morphometry and the pattern of palatal rugae among monozygotic and dizygotic twins in India. J Orofac Sci 2017;9:99-105.
 3.) Smitha T, Vaswani V, Deepak V, Sheethal HS, Hema KN, Jain VK. Reliability of palatal rugae patterns in individual identification. J Oral Maxillofac Pathol 2021;25:555