

# Association Between Gingival Recession and Its Biotype Among South Indian Population- A Retrospective Study

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## Abstract

**Aim:** The aim of our study is to know the association between gingival recession and its biotype among the South Indian population.

**Materials And Methods:** The study was conducted between September 2020 and March 2021, 86000 patient records were analysed, with 106 patients meeting the inclusion and exclusion requirements being included in the report. Gingival recession and the history and type of smoking habits were recorded. SPSS software was used to perform statistical analysis on the results.

**Results:** After analysing the results around 56.6% of the patients had thin gingival biotype when it was related with clinical attachment loss. The prevalence of thick and thin gingival biotypes was found to be 43.39 percent and 56.6 percent, respectively, with no significant relationship between age, gender and association of gender and gingival biotype.

**Conclusion:** This research could be useful in predicting the case's prognosis. Patients with a thin biotype have a higher incidence of gingival recession, so treatment modalities aimed at increasing gingiva thickness can improve the treatment outcome of recession coverage procedures.

**Keywords:** Biotype, Innovative technique, Gingival recession, Inflammation, Smoking, Tobacco

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## INTRODUCTION

The gingiva is made up of fibrous tissue that is covered by a mucous membrane that is firmly attached to the periosteum of the mandible and maxilla's alveolar processes(2). The mucosa covering the mandible from the gingival-buccal gutter to the origins of the mobile mucosa on the mouth's floor is included in the lower gingiva. The gingiva is attached to the tooth and forms a seal that protects the underlying bone and acts as an infection barrier. Bacterial plaques form as a result of poor oral hygiene, causing inflammation and the onset of gingivitis. Gingivitis can progress to periodontitis, a condition in which the seal between the gingiva and the tooth loosens, allowing infection and tooth breakdown(3,4). The gingiva is made up of an outer epithelium and an inner connective tissue network. Keratinization of the outer epithelial layer forms a protective layer around the tooth. Gingival fibroblasts are found within the inner gingival connective tissue and play an important role in tissue repair and the inflammatory response(5). Because of their ability to differentiate into multiple cell types and generate induced pluripotent stem cells, gingival fibroblasts are of particular interest (iPSCs). Furthermore, gingival fibroblasts are frequently studied as players in periodontal regeneration due to their multipotent potential.

If a tooth is in an abnormal position, the gums may recede around it(6). When the roots of the teeth become exposed as a result of receding gums, the teeth are at risk of decay, infection, and loss(7). People can stop or reverse the progression of gum recession if they seek treatment early on. Various treatments are available if the recession is severe and causing symptoms such as tooth sensitivity, pain, or infection. Deep cleaning, infection treatment, and tissue grafts are among them. Gum recession is a common problem, but many people are unaware that their gums are receding until it is too late. Gum recession is frequently caused by periodontal disease(7,8). An inflammatory reaction causes periodontal disease, which results in the loss of supporting

bone and tissue around a tooth. Gum recession usually affects all of the teeth in the same way. Gum recession is linked to advancing age(9). Around 88 percent of people over the age of 65 have at least one tooth with receding gums. People who smoke or use tobacco products have a higher risk of developing receding gums. Another factor is genetics, as people with thin or weak gums can pass these traits down through their families. Diabetes can also make receding gums more likely(10). Most crucially, receding gums can be a sign of underlying dental issues such as gum disease, which can lead to tooth decay and tooth loss. They may also cause bad breath and gum bleeding. The majority of mild gum recession cases do not necessitate treatment. Dentists may offer prevention advice and gum-monitoring services(11). Early intervention can be as simple as teaching effective but gentle brushing. Brushing teeth too hard or with a hard-bristled toothbrush is the most obvious and preventable cause. Instead, people should brush their teeth gently with a soft-bristled toothbrush, avoiding overbrushing(12).

The term "gingival phenotype" was coined to describe the wide range of thickness and width of facial keratinized tissue seen in clinical practise(13). The thickness of the gingiva in the faciopalatal/ faciolingual dimension is referred to as gingival biotype. Periodontal attachment loss and marginal tissue recession can both be caused by reduced gingival thickness(14). Seibert and Lindhe coined the term "periodontal biotype," which divided gingiva into "thick-flat" and "thin scalloped" biotypes. The thick gingival biotype is characterised by a broad zone of keratinized tissue with a flat gingival contour, indicating a thick underlying bony architecture that is more resistant to inflammation and trauma. Thin gingival biotype, on the other hand, is associated with a thin band of keratinized tissue and a scalloped gingival contour, implying thin bony architecture and sensitivity to any inflammation or trauma(15). Increased pocket formation in thick biotypes and gingival recession in thin tissues are both symptoms of periodontal inflammation. Direct visual assessment, periodontal probe, or direct measurements with endodontic spreaders, endodontic files, and callipers can all be used to determine gingival biotype. Only the buccal palatal measurement of gingival thickness is worth evaluating for clinical and research purposes if the terms "thick" and "thin" are focused on(16). To measure tissue thickness, a variety of invasive and non-invasive methods have been proposed. Direct measurement, the probe transparency (TRAN) method, ultrasonic devices, and a cone-beam computed tomography (CBCT) scan are some of these options. Its use of ultra - sonic devices to determine thickness is a non-invasive method that has been proven to be repeatable.

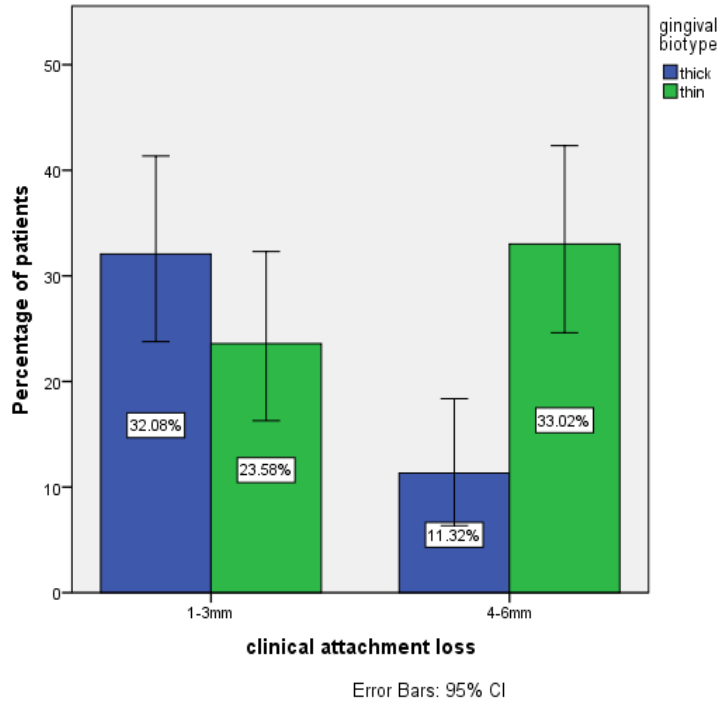
However, challenges in maintaining the directionality of the transducer, as well as device unavailability and high costs, are drawbacks(17). The cone-beam computed tomography scan (CBCT) has recently become a popular advanced diagnostic tool for determining the thickness of both hard and soft tissues(18). Our team has extensive knowledge and research experience that has translated into high quality publications(19–38). The main aim of our study is to know the association between gingival recession and its biotype among the South Indian population.

## Materials And Methods

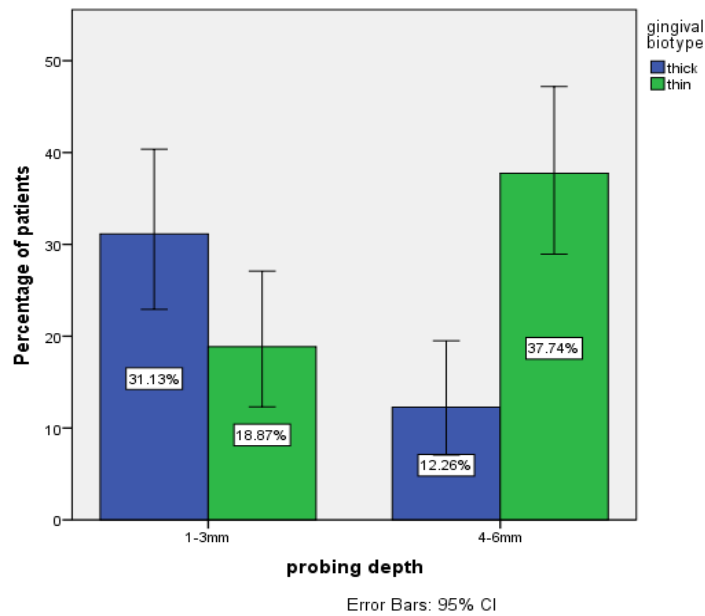
A retrospective cross sectional study was conducted in the department of Periodontics, Saveetha Dental College and Hospital, Chennai to evaluate the gingival recessions reported in our institution. The recession records, from Dias i.e dental information archiving software of the Department of Periodontics of Saveetha Dental College Chennai were reviewed retrospectively for all the patients with gingival recession from September 2020 to March 2021, 86000 patient records were analysed. All the cases were collected in specified time and only the patients who were periodontally compromised were included in the study. Patients with other pathologies and who were not histologically proven as periodontally compromised were excluded from the study. Ethical clearance for this study was obtained from the Institutional review board. Total of 106 gingival recessions were reported during this period. All cases were analyzed for age, gender, and site and the data was tabulated. The SPSS programme version 23 was used to analyse the data. The Pearson correlation and the chi-square test were used to test between the categorical values. P value < 0.05 was considered statistically significant.

## Results And Discussion

In our study 106 patients with gingival recession were reported. Gingival biotype was noticed in these reported patients. Around 56.6% of the patients had thin gingival biotype when it was related with clinical attachment loss (Fig:1). 47% of the patients with 1-3 mm and 4-6 mm probing depth had predominantly thin gingival biotype (Fig:2). Females had thin gingival biotype more which was around 35.85% and males had predominantly thick gingival biotype which was 21.70% (Fig:3). 5.66% of 10-20 years had thin gingival biotype, 17.92% of 20-30 years and 14.15% of 30-40 years had thick gingival biotype, 19.81% of 40-50 years and 10.38% of 50-60 years old patients has thin gingival biotype (Fig:4). 57.55% were female participants and 42.45% were male participants (Fig:5). 8.49% of 10-20 years old patients, 30.19% of 20-30 years, 22.64% of 30-40 years, 25.47% of 40-50 years and 13.21% of 50-60 years old patients (Fig:6).

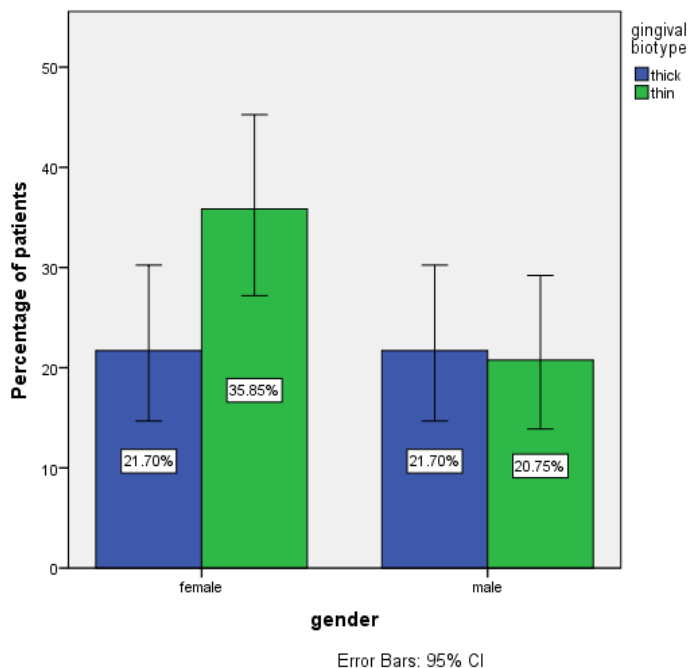


**Figure: 1:** The above bar graph represents the gingival biotype associated with clinical attachment loss. X-axis represents the clinical attachment loss and Y-axis indicates the responses. Blue indicates thick gingival biotype and green represents thin gingival biotype. 32.08% of patients with 1-3mm CAL and 11.32% of patients with 4-6mm CAL had thick gingival biotype and 23.58% of patients with 1-3mm CAL and 33.02% of patients with 4-6mm CAL had thin gingival biotype. Chi square test shows p value of 0.001 (<0.05), which was statistically significant.

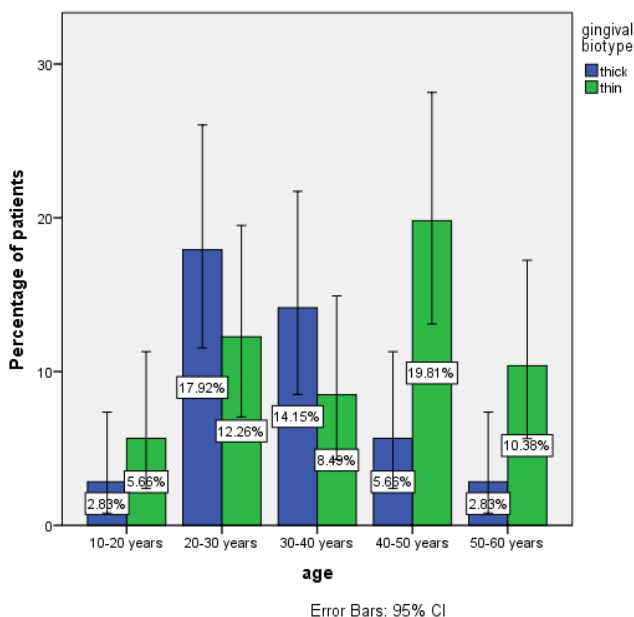


**Figure: 2:** The above bar graph represents the gingival biotype associated with probing depth. X-axis represents the probing depth and Y-axis indicates the responses. Blue indicates thick gingival biotype and green represents thin gingival biotype. 31.13% of patients with 1-3mm probing depth and 12.26% of patients with 4-6mm probing depth had thick gingival biotype and 18.87% of patients with 1-3mm CAL and 37.74% of patients with 4-6mm probing depth had thin gingival biotype. Chi

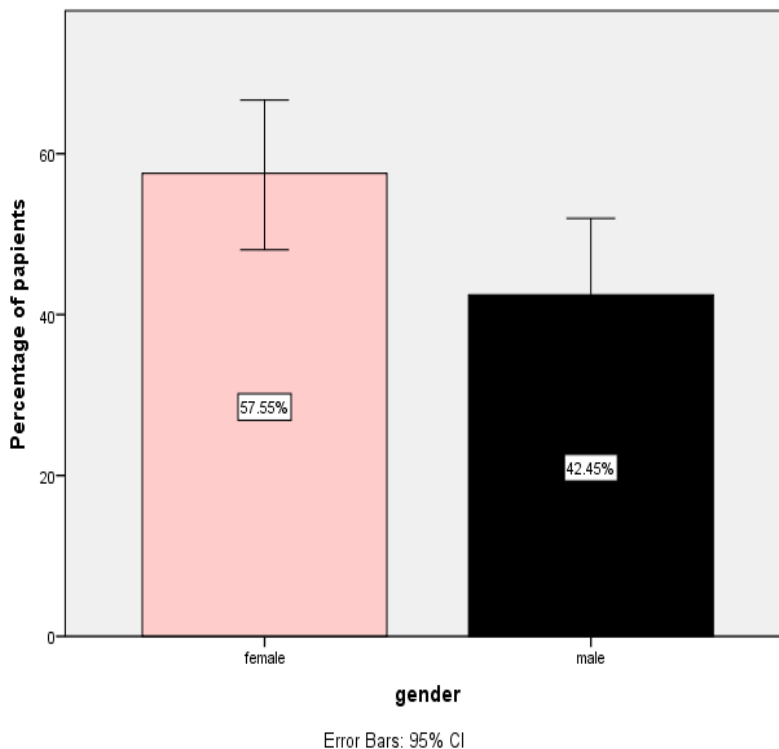
square test shows p value of 0.001 ( $<0.05$ ), which was statistically significant.



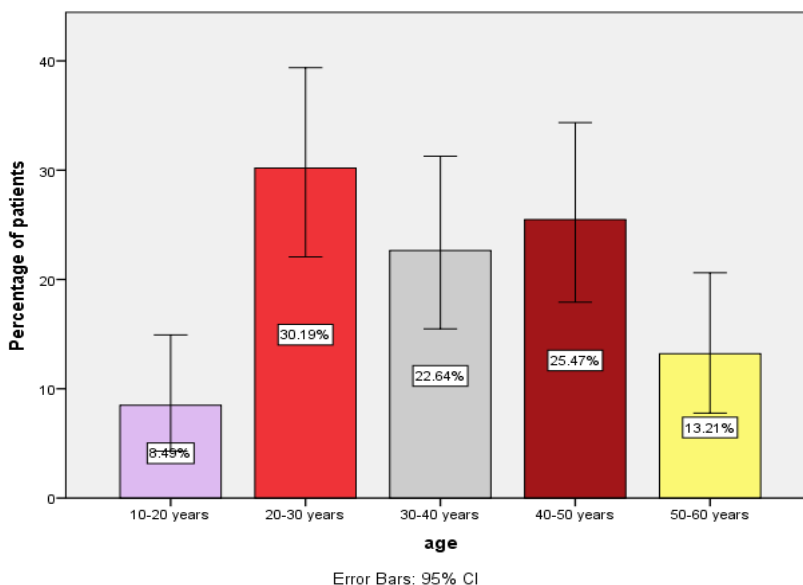
**Figure: 3:** The above bar graph represents the gingival biotype associated with gender. X-axis represents the gender and Y-axis indicates the responses. Blue indicates thick gingival biotype and green represents thin gingival biotype. 21.70% of female patients and 21.70% of male patients had thick gingival biotype and 35.85% female patients and 20.75% of male patients had thin gingival biotype. Chi square test shows p value of 0.119 ( $<0.05$ ), which was statistically not significant.



**Figure: 4:** The above bar graph represents the gingival biotype associated with age. X-axis represents the gender and Y-axis indicates the responses. Blue indicates thick gingival biotype and green represents thin gingival biotype. 2.83% of 10-20 years old patients, 17.92% of 20-30 years, 14.15% of 30-40 years, 5.66% of 40-50 years and 2.83% of 50-60 years old patients has thick gingival biotype. 5.66% of 10-20 years old patients, 12.26% of 20-30 years, 8.49% of 30-40 years, 19.81% of 40-50 years and 10.38% of 50-60 years old patients has thin gingival biotype. Chi square test shows p value of 0.005 ( $<0.05$ ), which was statistically significant.



**Figure: 5:** The above bar graph represents the gender population. X-axis represents the gender and Y-axis indicates the responses. 57.55% were female participants and 42.45% were male participants.



**Figure: 6:** The above bar graph represents the age population. The X-axis represents the age and Y-axis indicates the responses. 8.49% of 10-20 years old patients, 30.19% of 20-30 years, 22.64% of 30-40 years, 25.47% of 40-50 years and 13.21% of 50-60 years old patients.

Gingival recession is characterised by the loss of both soft and hard tissue. When gingiva thickness is reduced, the risk of gingival recession increases. Gingival tissue that is thicker is more stable and resists recession better(39). Gingival biotype refers to the thickness of the gingiva in the facio-palatal dimension, which is divided into three categories: thick, normal, and

thin. A thick biotype is more resistant to recession, according to several studies. Since studies have shown that gingival thickness is important in the development of mucogingival problems as well as the success of treatment for recession and wound healing, gingival thickness assessment is important in clinical periodontics. It's also been proven that people with thin marginal tissue are more likely to develop mucogingival problems, especially if their underlying bone is thin(40). There was a study which showed the association between the length of the recession and the width of keratinized gingiva had a strong relationship. This finding supports the widely held belief that a sufficient width of keratinized gingiva is critical in preventing gingival recession at a specific site. Similar findings were observed by Mamta Singh et al. This study showed thin gingival biotype more when compared to thick gingival biotype(41). In another previously done research, the thin gingival biotype was found to be 43.25 percent prevalent, while the thick gingival biotype was found to be 56.75 percent prevalent whereas in our study it was 43.39% of thick and 56.6% of thin gingival biotype(42). There was another study conducted in Saudi Arabia which was about association between gingival biotype and different facial phenotypes, here in a population of 80 subjects they found that 48.8% had thick gingival biotype and 51.2% had thin gingival biotype. This study was supporting our study as they had more thin gingival biotype than thick(43).

## Conclusion

This research could be useful in predicting the case's prognosis. Patients with a thin biotype have a higher incidence of gingival recession, so treatment modalities aimed at increasing gingiva thickness can improve the treatment outcome of recession coverage procedures. The prevalence of thick and thin gingival biotypes was found to be 43.39 percent and 56.6 percent, respectively, with no significant relationship between age, gender and association of gender and gingival biotype. But p value was statistically significant when associating clinical attachment loss, probing depth or age with the gingival biotype i.e  $p < 0.05$ .

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## Conflict Of Interest

The author declares no conflict of interest.

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