

Prevalence of Sinew String in Patients Coming to a Tertiary Care Hospital: A Descriptive Cross-Sectional Study

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ABSTRACT

Background: The aim of this study to evaluate the dentulous and edentulous maxillae in the microstructure of the incisive canals and their surrounding bone in order to show the structural qualities.

Study Design: The study was cross sectional being conducted at the Dental Department of DOW International Dental College, Karachi for six month from July 2022 to December 2022.

Methodology: A total number of patients was N=240. The right and left sides of each patient were classified as either edentulous or dentulous. After receiving written consent, the patients who were monitored on both were checked to see if sinew string was present or not. The data was analyzed by SPSS 21.

Results: There were 240 patients in all, 130 of whom were men and 110 of them were women. Males (54.1%) and females (46%) made up the edentulous and dentulous group. The patients with the greatest ages were 21- 51 years old. The patients' average age was 38 ± 15 years. The sinew string frequency was similar with respect gender. There was significant difference between edentulous and dentulous; $p < 0.005^{**}$ on both sides observed by using simply seen, pushing on the oblique line and pulling the cheek sideways.

Conclusion: Sinew string was attempted to maintain and control buccal mucosa movement and block the mouths posterior vestibule. The occurrence of sinew strings was greater than usual.

Keywords: Sinew strings, Dentulous, Edentulous, mandibular.

INTRODUCTION

Sinew string is a buccal mucosa structure resembling a frenum or wrinkle. In dentulous mandibles, it is typically observed from approximately the anterior border of edentulous mandibles, it is displayed along the distal surface of the lower second molar to that tooth, but in retromolar mandibles, it is seen along the distal surface of the lower second molar to that tooth.. In the case of dentulous jaws, the buccal mucosa may exhibit irregularities resembling frenums or wrinkles from around the distal surface of the lower second molar through the third molar, and in the case of edentulous jaws, from around the anterior border of the retro molar pad through posterior regions.^{1, 2} The effectiveness of a capacity for the patient to consume food, communicate, and interact with others can be significantly impacted by edentulism. The edentulous arches can be restored with dentures in their entirety thanks to a field of study known as complete denture prosthetics (CDP). Combining the art and science of dentistry into one profession is a challenging endeavor for doctors.³ The majority of edentulous patients should expect a higher quality of life once traditional full denture fabrication is completed; nonetheless, 30% of patients are dissatisfied. Appeals to secondary care for full dentures are rather common, and they typically entail loose dentures caused by resorbed mandibular ridges, which is exacerbated by high expectations and poor coping abilities. Examining such individuals frequently shows additional complicating concerns such as inappropriate base extension, inadequate denture base adaptation to tissues, and inaccurate registration of the retruded jaw.^{4, 5} In order to address these issues, the "suction denture impression technique" was brought into clinical practise.¹⁰⁻¹⁴ Abe invented this method in 1999 to make it easier to suction a mandibular full denture using a closed-mouth functional impression technique than it had previously been. If the outer border of the denture could be completely sealed by the moving tissues of the oral mucosa, the mandibular full denture might achieve efficient suction in addition to the maxilla. A comprehensive evaluation approach called the Oral Health-related Quality of Life (OHQoL) measures how oral health issues affect people's everyday life. Studies employ the GOHAI, OHIP014, and OHIP-EDENT as assessment tools. For edentulous patients in

particular, OHIP-EDENT was developed, and its dependability.^{6, 7} In the deep area where the streaks appear, there is anatomically a pterygomandibular raphe. The connection of buccal mucosal movement and stress makes the collagen fibre bundles that make up the mucosa tissue of the sinew string visible under a microscope. When present, the sinew string has a significant impact on the mandibular denture's breadth and extension in the distal buccal area. Inadequately built mandibular full dentures may have functional motions that do not match the behaviour of the sinew string, which can lead to involuntary strain during mastication and swallowing and rupture the marginal seal, lowering the stability and retention of the denture.^{8, 9} According to research, the sinew string manifests itself in a variety of anatomical variants and is only found in 10–20% of the population. These factors make it common for ordinary dentists and even prosthodontists to overlook this structure, which may ultimately compromise the retention and stability of mandibular detached.¹⁰

METHODOLOGY

The study was cross sectional being conducted at the Dental Department of DOW International Dental College, Karachi for six month from July 2022 to December 2022. In the preceding article, $n=Z2PQ/d2$ $z = 1.96$ with a 95% confidence interval permitted error of 5% and a prevalence of 20%. Data was collected from patients attending the Medical College Dental Department using convenience sampling. Inclusion criteria: patients age >20 years, edentulous and dentulous. Exclusion criteria: Patients who refused to provide consent were excluded. Regardless of the existence or absence of additional teeth, the side of the teeth was labeled as dentulous, while the side without any of the mandibular molars was labeled as edentulous. As a result, each patients right and left sides were categorized as either edentulous or dentulous. Following the receipt of written consent, the patients observed on both were examined for the presence or absence of sinew string. Data were gathered, put into SPSS version 21 for descriptive statistical analysis, and percentages and frequencies were calculated.

RESULTS

A total number of patients was N=240. The population had 38% the sinew string, of which 18% had it on one side, 20% had it on both sides, and 20% did not have it on the other side. The 90 patients were completely edentulous on both sides and 150 patients of dentulous on both sides while 20 patients. The sinew string was

Table 1: Demographic variables

Variables		N= 240(%)
Age	20 years	10(4.1%)
	21-50 years	80(33.3%)
	>51 years	150(63%)
Gender	Male	130(54.1%)
	Female	110(46%)
Income	Low	180(75%)
	High	60(25%)
Education	Illiterate	150(63%)
	Literate	90(39%)
Edentulous	Left and right side	90(39%)
Dentulous	Left and right side	150(63%)

Mean ± SEM: ANOVA SPS 21 Test* p< 0.0; **p<0.0; ***p<0.00:

Table 3: Survey chart of sinew string

	Left					Right				
	Clear visible	Slight visible	Not visible	Clear visible	Slight visible	Not visible				
Simply seen	1	2	3	4	5	1	2	3	4	5
Pulling the cheek sideways	1	2	3	4	5	1	2	3	4	5
Pushing on the oblique line	1	2	3	4	5	1	2	3	4	5

Mean ± SEM: ANOVA SPS 21 Test* p< 0.0; **p<0.0; ***p<0.00

Table 4: To evaluate Dentulous jaws on both sides

	Dentulous jaws N=150				P=value
	Male		Female		
	Right side	Left side	Right side	Left side	
Simply seen	43.02±10.1	44.07±09.2	45.04±05.1	46.03±06.1	<0.005**
Cheek pulled with a mirror	48.01±11.3	49.05±04.6	47.03±03.2	49.06±03.3	<0.005**
Pushed on the external oblique line	51.05±10.8	53.09±07.1	50.08±07.4	49.04±01.1	<0.005**

Mean ± SEM: ANOVA SPS 21 Test* p< 0.0; **p<0.0; ***p<0.00:

Table 5: To evaluate edentulous jaws on both sides

	Edentulous jaws N=90				P=value
	Male		Female		
	Right side	Left side	Right side	Left side	
Simply seen	65.05±9.3	63.05±10.1	65.05±02.5	65.03±01.2	<0.005**
Cheek pulled with a mirror	66.05±03.5	61.04±05.7	67.02±05.1	69.08±01.1	<0.005**
Pushed on the external oblique line	69.04±07.1	63.03±08.5	60.07±05.2	69.01±06.2	<0.005**

Mean ± SEM: ANOVA SPS 21 Test* p< 0.0; **p<0.0; ***p<0.00:

According to our results, the appearance ratio of males N=130 that belong to category simply seen was shown right and left side was (43.02±10.1, 44.07±09.2); and female N=110 ratio was (45.04±05.1, 46.03±06.1) ;p<0.005**. Not visible was 45% and 48%, grade 5. The appearance ratio seen in the male and female by pulling out of cheek sideways with finger and dental mirror were (48.01±11.3, 49.05±04.6) and (47.03±03, 49.06±03.3) ; p<0.005** right and left side and assessment grade 5. The appearance ratio seen in male and female by pushing the buccal mucosa on the oblique lines were (51.05±10.8, 53.09±07.1) and (50.08±07.4, 49.04±01.1); p<0.005**in the right and left side.

According to our interpretation, the appearance ratio simply seen for male and female were (65.05±9.3, 63.05±10.1) and (65.05±02.5, 65.03±01.2); p<0.005**. The appearance ratio of cheek pulling by a mirror was (66.05±03.5, 61.04±05.7) and (67.02±05.1, 69.08±01.1); p<0.005**. The appearance ratio seen in male and female by pushing the buccal mucosa on the oblique line were show greater significantly edentulous in both sides; p<0.005**. Not visible and grade 5.

DISCUSSION

The anterior component of the sinew begins in the alveolar mucosa around the distal half of the second molar and extends

There were 240 patients in all, 130 of whom were men and 110 of them were women. Males (54.1%) and females (46%) made up the edentulous and dentulous group. The patients with the greatest ages were above 51 years old. The patients' average age was 38 ± 15 years. Socioeconomic issues that are associated with edentulous patients, such as illiteracy (63%), poor income (75%), and few sources of assistance for elderly patients, are important. These include the widespread and common occurrence of full and partial tooth loss in our societies.

Table 2: To evaluate the sinew strings with respect to gender

Gender	Left	Right	P=value
Male	52.06±19.1	57.03±21.4	=0.111
Female	54.03±13.7	55.07±15.8	=0.121

Mean ± SEM: ANOVA SPS 21 Test* p< 0.0; **p<0.0; ***p<0.00:

According to our interpretation, total N=240 patients, male n=130 while female were n=110. In terms of gender, the frequency of sinew string on both sides was the same seen in Table 2.

posteriorly in the dental arch where the second molar is present but the third molar is lacking. The sinew can be visible with the naked eye if the alveolar mucosa-originating portion is attached to the alveolar bone and periosteum below via connective tissues. However, if the sinew is tugged with a finger or dental mirror, the alveolar mucosa moves from the base of origin point with it. To put it another way, the sinew might not be connected to the periosteum, then it becomes challenging to see the sinew in this situation. The buccal mucosa is frequently the source of the sinew strings when the jaw has a partially impacted wisdom tooth. And it is believed that they are not often seen with the naked eye. The buccal mucosa is where the sinew strings in this instance are placed after being stretched from the anterior edge of the retro molar pads.^{11, 12} When it was only seen, a low appearance ratio of 9–10% was present regardless of whether the jaws were missing teeth or not. Furthermore, there was discernible difference between patients with dentulous and edentulous conditions in the ratio of patients with no visible sinew, which was about 45%. The ratio of sinew strings is 20% when both boys and girls who are edentulous and dentulous are taken into account. Regarding the various categories of observation, dentulous males and females had an appearance ratio of about 20% when the cheek was pulled out to the side with a finger or a dental mirror.¹³ The appearance ratio for dentulous males and females was greater at around 29%

when it was observed by pushing the buccal mucosa on the oblique line with a finger or dental mirror, which is more readily discovered. These observational approaches are known to successfully raise the appearance ratio by pressing the buccal mucosa on the oblique or pulling out the cheek in a sideways direction with a finger or dental mirror.^{14, 15} However, even when a different observation method was used, the appearance ratio for edentulous jaws did not improve as much as it did for dentulous jaws. One theory is that tooth loss reduces occlusal forces (masticating forces), which are then linked to poor mucosal responses and a deterioration in oral mucosal function, both of which hinder the sinew strings from being lifted. This enlarged cheek would draw the sinew string up from its position in the back of the oral vestibule.¹⁶ Given that the collagen bundle that makes up the sinew string, which is buried in the cheek mucosa, has the ability to rigidly extend, the sinew string will appear to rise when the cheek expands, the mucosa stretches, and the hard component is left behind. In this area, where a mass of undigested food should not be held for an extended period of time, the buccal mucosa that surrounds the sinew string would draw a line between the mucosal space that can handle different activities, including food mixing, and the space that cannot handle mixing. And this border would be built into a wall at the buccal vestibule's rear. Additionally, this wall serves to direct food mass into the oral vestibule, which has enough space and is already open and accessible after prior mastication is complete.¹⁷ This direction aids in the beginning of a new masticatory cycle that compresses food mass to the alveolus and dentition. Even though the sinew string travels in tandem with buccal mucosal movement since its starting point is typically 2–3 mm distant from the second molar's distal location, it appears that the sinew string would seldom affect the periodontal tissues. The second molar's distal portion contains the wall of mucosa, which acts to enclose the second molar's distal surface by mostly being made of the sinew string that is elevated during mastication and makes a movement to push the food bolus from the distal surface of the second molar, where the food was probably left behind.¹⁸ One sinew string on one side was discovered in 15% of the cases. Since the unilateral presence of sinew string, it is possible that these structures exist as well. There might be more than one sinew string pressing the exterior oblique line. This may be due to the rarity of sinew strings, and the likelihood of finding many sinew strings in one location may even be smaller. The importance of sinew string in determining the width and extension of dentures was discussed along with improved impression-making techniques for creating distobuccal-area dentures that can be suctioned effectively. Examining whether this structure is present is essential since a greater prevalence rate of sinew strings.^{19, 20}

CONCLUSION

Sinew string was attempted to maintain and control buccal mucosa movement and block the mouths posterior vestibule. The occurrence of sinew strings was greater than usual.

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