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Irritation Fibroma Of The Oral Mucosa – A Clinicopathologial Study Of 101 Cases

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KEYWORDS	ABSTRACT:	
Irritational fibroma hyperplasia, collagen fibres, parakeratosis, inflammation	A form of such a controlled cell proliferation is which cells adapt to stress. Hyperplasia constitute an organ or tissue. Hyperplastic lesions are com frequency with which the oral tissues are trauma reaction to some irritant, they are often called 're known as traumatic fibroma, focal fibrous hyperp lesion caused usually by chronic trauma to oral m reactive hyperplasia that is typically found in mucosa, lateral border of tongue and lower lip. It is lighter in colour than the surrounding tissue b channels. Although irritation fibroma is one of intraoral exophytic lesions of the soft tissues, ¹² lesion	s hyperplasia which is one method by es an increase in the number of cells in mon in the oral cavity, because of the atized. Because these conditions are a eactive lesions'. Irritation fibroma also lasia and hyperplastic scar, is a reactive ucous membranes. It is a very common traumatized areas such as the buccal is a painless broad based swelling that ecause of its reactive lack of vascular of the most common lesions among there have been few studies of this

Introduction

The normal cell is a restless microcosm constantly modifying its shape and altering its constitution in response to changing demands and stresses, Unless the stresses become too severe, the cell tends to maintain a relatively constant structure³⁸

Whenever cells are destroyed by injury or disease in a tissue composed of stable or labile cells, the marginal vital cells are capable of dividing to replace to some extent the losses, Fortunately, control mechanisms adjust the response, usually bringing it to a half when the deficit has been made up.

A form of such a controlled cell proliferation is hyperplasia which is one method by which cells adapt to stress. Hyperplasia constitutes an increase in the number of cells in an organ or tissue and is often the result of irritation, although it may also be compensatory or adaptive.³⁸

Hyperplastic lesions are common in the oral cavity, because of the frequency with which the oral tissues are traumatized. Some lesions will be composed of granulation tissue, some will be composed of connective tissue and still others will be composed of epithelium. Because these conditions are a reaction to some irritant, they are often called 'reactive lesions'. They arise from the epithelium or connective tissue of the mucous membrane and usually produce an exophytic, raised surface lesion. While their clinical features may resemble that of a neoplasm, the reactive lesions are not spontaneous growths: rather they are examples of hyperplasia caused by some local injury. Like other forms of hyperplasia, these growths are selflimiting and will regress with removal of the offending irritant.¹⁶

Localized overgrowths of fibrous tissue are a frequent occurrence in the oral mucosa. Though they are probably the commonest soft tissue lesions, there is much diversity of opinion as to their nature. Thus, in the standard textbooks of oral surgery and pathology they are described as fibromas, fibrous epulides, fibrous hyperplasias, fibro-epithelial polyps or by similar titles and often it is not clear whether they are considered to be neoplasms or hyperplasias or if both types of lesions are thought to exist, what may be the

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distinction between them.³ Shafer, Hine and Levy⁴⁶ for example consider that both neoplasms and hyperplasias occur, but they doubt whether a distinction can be made histologically.⁴⁶

Jerry Bouquot, Karsten and Morgantown¹² used the term irritation fibroma' to replace the term 'fibroepithelial polyp'. According to them, the irritation fibroma is used to describe presumably a hamartomatous or hyperplastic process, not neoplasia.¹²

Irritation fibroma also known as traumatic fibroma, focal fibrous hyperplasia and hyperplastic scar, is a reactive lesion caused usually by chronic trauma to oral mucous membranes. Overexuberant fibrous connective tissue repair results in a clinically evident submucosal mass. There is no gender or racial predilection for the development of this intraoral lesion. It is a very common reactive hyperplasia that is typically found in traumatized areas such as the buccal mucosa, lateral border of tongue and lower lip. It is a painless broad based swelling that is lighter in colour than the surrounding tissue because of its reactive lack of vascular channels. The surface may occasionally be traumatically ulcerated in larger lesions. Traumatic fibroma has limited growth potential, usually not exceeding 1 cm in diameter and rarely greater than 2 cm. ³⁰

Collagen overproduction is the basic process that dominates the microscopy of the lesion. Fibroblasts are mature and widely scattered in the dense collagen matrix. Sparse chronic inflammatory cells may be seen, usually in a perivascular distribution. Overlying epithelium is often thinned and hyperkeratotic because of chronic low grade friction.

Although irritation fibroma is one of the most common lesions among intraoral exophytic lesions of the soft tissues,¹² there have been few studies of this lesion.

Along with a clinical appraisal of the lesion, the studies have also evaluated histologically the arrangement of collagen fibers by dividing them into the radiating and circular type. ^{3,26}

Since no such work has been done in the Indian subcontinent, the present study was undertaken.

Materials and methods

The material used for this retrospective study consisted of 367 cases of localized fibrous overgrowths of the oral cavity which had been clinically diagnosed as fibroma, benign fibrous growth, irritation fibroma, fibrous epulis, mucocele, fibro- epithelial polyp, lipoma, cyst and fibrous hyperplasia. These cases were retrieved from the files in the oral pathology and microbiology dept, Nair Hospital Dental College for a period of 11 years from 1992 to 2002. As the purpose of this study was to carry out a clinicopathologic survey irritation fibroma, lesions of which were histopathologically diagnosed as fibrous epulis, gingival fibromatoses and pyogenic granuloma, were

excluded. This amounted to 101 cases being in the final analysis. The patient's record consisted of data regarding age, sex, duration, location, nature of the lesion (pedunculated or sessile) and provisional clinical diagnosis. The biopsy specimens were fixed in 10% neutral formalin. The formalin fixed tissues were subjected to routine processing which included dehydration through ascending grades of alcohol, clearing through xylol, and then embedded in paraffin. Blocks were prepared and the tissues were sectioned at 5 µm thickness. The tissue sections sere then mounted on a glass slide using egg albumin as an adhesive. All slides were then stained with haemotoxylin and Eosin.⁴

DISCUSSION

Hyperplasia is defined as a self-limiting process, resulting from a reaction to stimulation or irritation. After the removal of the causative factor, the process usually regresses. A neoplasm does not have this self-limiting character and continues to grow even after the causative agent has been eliminated.

The histopathological appearance of oral mucosal hyperplasias is often indiscernible from lesions which in textbooks are called as neoplasms. Most of these lesions are a response of the tissues to a non-specific infection or to other stimulants and irritants which either stimulate the proliferation of such cell elements as epithelial cells, fibroblasts, collagen and vascular endothelial cells or lead to the destruction of tissue^{2,15}

Hyperplasia has been offered as a defense mechanism and this may in part explain the presence of the usually associated inflammation. The metabolic potentiality of the cell of the affected part may be the key to hyperplasia. The manifestations of excessive number of cells could be the result of an increase in mitotic activity or a reduction in the rate of cellular destruction. Where hypertrophy is associated with extensive use, hyperplasia is more closely related to long standing irritation¹⁶

Microscopically hyperplasia is characterized by the presence of a loose connective tissue stroma, marked vascularity and varying degrees of inflammatory infiltration. Collagen deposition is at a minimum or may be absent.

The pathogenic factors of hyperplasia are vague and the cytological mechanisms involved are unknown. It is suspected that workload, irritation and endocrine stimulation play roles as exciting factors. The amount of cellular activity is conditioned by such factors as adequacy of blood supply, the nutritional status of the part, the age of the person and the capacity of the cells to reproduce or enlarge.³⁸

Variations in the clinical course and microscopic character of hyperplastic lesions occur frequently enough to suggest a vague relationship between hyperplasia and neoplasia. Occasionally a hyperplastic oral lesion of long duration may not regress with

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elimination of irritants. Instead there is a gradual reduction of inflammatory cells and an increase in the productivity of collagen. Such a lesion is difficult to distinguish from a fibroma. The lesion may persist and follow the clinical course of a fibroma. The implication is that neoplasia may result from irritation and that hyperplasia and neoplasia are not always completely separable.

Reactive hyperplasias are a group of localized fibrous connective tissue lesions that commonly occur in the oral mucosa secondary to injury. These lesions present as submucosal masses that may become secondarily infected when traumatized during mastication. For these localized non- neoplastic lesions of the oral mucosa, various terms have been used in the Oral Pathology and Oral Surgery literature which include irritation fibroma, traumatic fibroma, fibrous hyperplasia, focal fibrous hyperplasia, fibrous polyp and fibro- epithelial polyp.²⁶ Of these, irritation fibroma seems to be the most popular term, 12,14,20,29

Although irritation fibroma is one of the most common intra-oral exophytic lesion of the soft tissues,¹² there have been few studies done on this entity. Therefore, the present retrospective study was carried out in the department of Oral Pathology & Microbiology, Nair Hospital Dental College to evaluate the clinical and histopathological features of 101 cases of irritation fibromas. Since the direction of collagen fibers of irritation fibromas, occurring in the non-keratinized mucosa is in a circular pattern and in a radiating pattern in the keratinized mucosa, an attempt was made to offer a plausible explanation for the above findings.

Out of the 101 cases histopathologically diagnosed as imitation fibromas, 59 were in the cheek mucosa, 11 in the labial mucosa, 9 on the tongue, 6 in the hard palate, 15 on the gingival mucosa and one in the floor of the mouth. Tiecke⁴⁹ and Noville³⁰ have stated that the most common site for imitation fibroma is the mucosa of the cheek at a position comparable to the level of the occlusal surfaces of the teeth. The high incidence of imitation fibroma in the cheek mucosa in the present study support the explanation put forward by the above workers.

In our study most of the lesions occurred in patients between the third and fourth decades of life. Previous studies^{3,12} have shown that the lesions were seen between the third and seventh decades of life. This is contrary to our findings.

There was a higher incidence of lesions in males in the present study while females showed predominance over males in the previous studies. This discrepancy could be due to more male patients reporting for treatment.

In the present endeavor, the size of majority of the lesions ranged from 1 mm to 13 mm with few lesions (11.22%) of more than 13 mm size. 30 Most irritation

fibromas, according to Neville³⁰ are 1.5 cm or less in diameter which is in accordance with this study.

Majority of the lesions were of the pedunculated type (67%) than sessile (31%). Since irritation fibromas can be of pedunculated or sessile types, a suitable explanation cannot not be offered for observing more of pedunculated types of lesions in this study.

A summary of age and sex of patients, duration and size of the lesions in our study did not show a significant statistical difference when evaluated by Student's t- test and Pearson's Chi-square test. But the mean duration in circular types of lesions was 34.68 months while in radiating pattern the mean duration was 19.32 months. We infer that irritation fibromas of longer duration produce stretching of collagen fibers resulting in a circular pattern of arrangement of collagen fibers while growths with a shorter duration are usually proliferative and produce a radiating pattern of collagen fibers.

Histopathological evaluation of epithelial changes showed that parakeratosis was the most common form of keratinization in circular and radiating lesions.

Regezi and Sciubba³⁶ have stated that though irritation fibromas are submucosal masses, their surface may exhibit hyperkeratosis from secondary trauma. Parakeratosis and lack of granular layer are the general rule in the oral mucous membrane, except on gingiva and hard palate where there is a presence of a stratum corneum.³⁹ The above statement makes us ponder that the increased percentage of parakeratosis in our cases could be based on this fact, since the highest incidence of irritation fibromas were seen on the buccal and labial mucosa which lack a proper stratum corneum.

An atrophic epithelium was seen in 31.68% of cases, hyperplasia was seen in 15.84% and normal thickness in 52.48%. The predominance of a normal epithelial thickness in both the circular and radiating lesions can be attributed to the fact that the lesions had not grown to a dimension where they could have induced changes like atrophy and blunting of rete ridges.

An observation of the configuration of rete ridges in the circular and radiating lesions revealed that there was absence of rete ridges in the circular lesions in 18 out of 23 lesions. It could be that the growth pattern in these lesions may be responsible for stretching of epithelium, resulting in the absence or blunting of rete ridges.

Connective tissue observations revealed that 62.38% of all lesions showed mild (+) vascularity, 26.73% lesions with moderate (++) vascularity and 1.98% lesions of intense (+++) vascularity. Duration is a deciding factor for the size and vascularity of a lesion. A longer duration implies that the vascularity would diminish. Since most of the lesions in our study were within the specified size, it is expected that a moderate vascularity would be seen.

Inflammation was in all 101 cases, out of which 86.14% lesions showed mild (+) inflammation, 12.87%

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lesions of moderate (++) inflammation and 1 (0.99%) lesion with severe (+++) inflammation. A mild chronic inflammation cell infiltrate is generally seen in irritation fibromas, 30,38 Our findings support the observations of above workers.

Additional features observed in the connective tissue were adipose tissue, calcification, hyalinization, myxomatous degeneration and giant fibroblasts. Most of these features were present in circular type lesions.

Hyalinization and myxomatous degeneration are seen in lesions of long standing. Since they were seen in a greater proportion in circular lesions, we presume that such types of irritation fibromas with a long duration, might be responsible for these changes.

Distribution of the lesions according to the type of mucosa showed that 71 lesions were present on the lining mucosa, out of which 85.92% showed circular pattern of collagen fibers and 14.8% showed radiating pattern21 lesions were present on masticatory mucosa (i.e. palate and gingiva). All the lesions were of radiating pattern. In the specialized mucosa (i.e. tongue) 9 lesions were seen and all of them had radiating pattern. These results are in accordance with the work of previous workers. ^{3,26}

Barker et al³ speculated that a low level of trauma might produce a circular lesion on a mobile base but a radiating lesion on a fixed base and a greater degree of trauma would produce only radiating lesion on either a mobile or fixed base. Toida et al ²⁶ supported the hypothesis put forward by above workers.

Though it is difficult to reconcile to the fact that differing degrees of trauma might be responsible for the direction of collagen fibers in irritation fibromas at different mucosal sites, we are not able to offer a better explanation.

Hence we agree and support the hypothesis put forward by these researchers.

In conclusion, we would like to make a note of some of the interesting features, that we observed in the circular and radiating patterns of collagen fibers in irritation fibromas.

The circular pattern was seen commonly on the buccal mucosa followed by the labial mucosa, had a slight male predominancewas present for a longer duration and had an equal number of sessile and pedunculated lesions. Histopathologic picture revealed absence of rete ridgsmoderate vascularity, mild inflammation and additional changes like hyalinization and myxomatous degeneration. All the above features are suggestive of a slow growing or a regressive lesion.

The radiating type of irritation fibromas seen more commonly on the gingiva followed by the hard palate and dorsum of tongue were present for as short time, had a slight female predominance and had more pedunculated lesions. In histopathology, Parakeratinization was commonly seen, with a hyperplastic epithelium and mild vascularity. All these characteristics point out to a fast growing lesion. In clinical practice situations arise, when a decision has to be made whether surgical removal of a lesion can be deferred, especially in medically compromised patients.

As all the histopathological features are not always seen in a small bit of biopsy, direction of collagen fibers will give a clue to the possible biologic behavior of the lesion in such biopsies. If lesions are slow growing as in circular type, the surgeon can postpone the surgery till the condition of the patient improves. The results of this study show that there are two distinct lesions, based on the direction of the collagen fibers, the clinical implication of which needs to be probed in depth.

SUMMARY AND CONCLUSIONS

Few studies ^{3,26} have discussed the histological variants (circular and radiating) of irritation fibromas and their clinical features.

In the present studyclinico-pathological differences between circular and radiating type of irritation fibromas and the direction of collagen fibers in the connective tissue, were evaluated using Haemotoxylin and Eosin and Van Gieson Stain.

The study group consisted of 101 cases, out of which 61 cases were of circular type and 40 cases of radiating type irritation fibroma.

- The following conclusions were drawn from this study:
- 1) Buccal mucosa was the prime location of irritation fibromas, as 58.42% of all lesions were at this site.
- 2) Most common age for the occurrence of the irritation fibromas was in the 3rd and 4th decades of life. The mean age was of
- 41.7 years and ranged from 14 to 82 years.
- 3) Irritation fibromas were seen predominantly in males than in females, with the ratio of 1:0.87.
- 4) Mean size of the lesions was 15.29 mm in the circular type irritation fibromas while in radiating lesions it was 14.37 mm i.e. in both types, it was around 1.5 cm.
- 5) The circular type of lesions was of longer duration (mean 34.68 months) than radiating type lesions (mean 19.32 months).
- 6) Out of 101 cases, majority (67%) were pedunculated. The percentage of pedunculated lesions was more in circular type i.e.77%.
- In both circular and radiating types of lesions, parakeratinization was the most common form of keratinization i.e. 75.25%.
- 8) There was predominance of normal epithelial thickness (52.48%) in circular and radiating types of lesions. 36% of 61 circular lesions showed atrophic epithelium.
- Out of 23 lesions which showed absence of rete ridges, 78.26% lesions were of circular pattern and 21.74 lesions were of radiating pattern.
- 10) In the connective tissue, mild vascularity was present in 62.30% of all lesions, 26.73% of lesions were of moderate vascularity and 1.98% lesions

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showed abundant vascularity.

- 11) Inflammation was seen in all the lesions in which 86.14% cases showed mild inflammation 12.87% of lesions were moderately inflamed and 1 lesion (0.99%) showed severe inflammation
- 12) Additional features like adipose tissue, calcification hyalinization, myxomatous degeneration and giant fibroblasts were observed in few lesions. The majority of these additional features were observed in circular type of lesions.

13) The non-keratinized lining mucosa had 85.92% of circular pattern lesions and 14.08% radiating pattern lesions. Keratinized masticatory mucosa presented 100% of radiating lesions while 100% of lesions present on specialized mucosa (tongue) were of radiating pattern.

In accordance with previous studies, ^{3,25} the present work has confirmed the findings that low level of trauma on a mobile non- keratinized mucosa produces a circular pattern of collagen fibers in irritation fibromas and a radiating pattern of collagen fibers on an immobile keratinized mucosa, while a greater degree of trauma produces only a radiating pattern on mobile and fixed mucosa.

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