Short Communication

Proposal of a minimally invasive approach diagnosing desquamative gingivitis-associated diseases

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Abstract:

**Background:** We aimed to present a minimally invasive clinical approach to collect material for histopathological analysis and diagnosis of desquamative gingivitis (DG). To the best of our knowledge, no similar work has been published.

**Materials and Methods:** The proposed technique involves Nikolsky's test for the collection of tissue samples. It consists of the histopathological analysis of the bullous membrane formed in cases with positive Nikolsky's sign (NS). Three patients without a previous diagnosis of the disease agreed to undergo this protocol before a biopsy.

**Results:** The diagnoses of the three cases reported here were mucous pemphigoid (MP), pemphigus vulgaris (PV), and lichen planus (LP). The tissue samples collected using this technique were sufficient to microscopically observe partial-thickness epithelium (diagnosing PV) or full-thickness epithelium (diagnosing MP). The diagnosis of LP was only possible by conventional biopsy.

**Conclusion:** We observed, for different cases, some advantages of the proposed technique: minimally invasive, potentially superior to exfoliative cytology, easily performed, and with low costs.

**Key words:** Benign mucosal pemphigoid, gingival diseases, lichen planus oral, oral examinations, pemphigus vulgaris

INTRODUCTION

This brief report aimed to describe a minimally invasive clinical technique to collect material for histopathological analysis and diagnosis of desquamative gingivitis (DG). To the best of our knowledge, no similar work has been published. DG is a common clinical manifestation of different diseases in the nonplaque-induced gingival periodontal disease group, as per the current classification of periodontal diseases.¹ The current gold standard method for the final diagnosis of these diseases in dental practice is the incisional biopsy. The great resistance among most dentists and even patients is well known when it comes to biopsy, which can be a result of myths, lack of knowledge, or unwillingness to perform this type of surgical procedure or to acquire specific knowledge to do it correctly.²⁻³ Thus, the objective of the work was to introduce a minimally invasive, reproducible, and easily performed technique that may be useful for the histopathologic diagnosis of diseases that commonly manifest as DG. At this point, the technique should not be a replacement to biopsy, but it appears as a promising alternative for use in campaigns and early diagnosis when clinical situations require the postponement of a conventional biopsy.

MATERIALS AND METHODS

**Case selection**

The included patients spontaneously sought dental care at the oral medicine service of the authors’ institution. Inclusion criteria comprised patients without previous diagnosis and with clinical manifestation of DG. Three cases of patients who agreed to perform this minimally invasive procedure before having the results of their general presurgical exams were illustrated here. This protocol was approved by the ethics committee (document 3.776.075).

**Proposed technique**

Nikolsky’s test is performed using a needleless plastic syringe to promote negative pressure on a single region of oral mucosa near a desquamative/erythematous area. After a few seconds of observation, the mucosa may manifest a blister, desquamation, or just erythema with small wound lining the contact with the syringe. Once a blister or desquamation occurs after the observation period, the procedure is repeated on other areas until a positive result is achieved and material is collected.

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negative pressure, the next step is to remove the “pellicle” of desquamated tissue with tweezers, and then place it on a stiff paper before taking the set to a bottle with formaldehyde (or Michel’s transport if requesting immunofluorescence).

RESULTS

Figure 1 shows the DG cases diagnosed using the proposed minimally invasive technique. In the first case, a 34-year-old female patient presented to the service complaining about gum bleeding on brushing in the last 4 months. In the second case, a 33-year-old female patient reported 1 year of unsuccessful gingivitis treatment. On physical examination, we also find ulcerative skin lesions on their dorsum and abdomen. In the third case, a 39-year-old woman presented with melanotic lip stains; bleeding gums; and small, white reticulated lines near the gingival mucosa. All the collected samples were submitted to microscopic evaluation after paraffin inclusion, with 3-μm slides stained with hematoxylin and eosin. The diagnoses were mucous pemphigoid (MP), pemphigus vulgaris (PV), and lichen planus (LP) for the first, second, and third cases, respectively.

DISCUSSION

DG is a nonspecific periodontal manifestation characterized by erythema, desquamation, and ulceration of gingival mucosa, sometimes accompanied by lesions in other oral or even extraoral regions. Patients usually report a sensation of scaling of the gums, with variable levels of pain. Upon clinical examination, the professional will notice in DG cases that the gingiva is altered, mainly due to the appearance of edema and erythema. Areas of ulceration and flaking may or may not be seen. Therefore, in many cases, DG may mimic common periodontal diseases, such as gingivitis and periodontitis. Semiotics using Nikolsky’s test will be essential for the examination in the face of complaints of DG, especially if an appropriate biofilm control is already installed. DG is present in 35%–48% of all cases of MP, 24%–45% of LP, and 3%–15% of PV (Al Abeedi et al., 2015). These epidemiological data are used to justifying the mandatory inclusion of these diseases in clinical evaluation concerning the DG picture. Other conditions such as desquamation in reaction to toothpaste, contact with allergens (e.g., cinnamon gums), and lichenoid reactions (e.g., against amalgam restoration) must also manifest as DG. In such cases, an appropriate anamnesis and the removal of possible local irritants can quickly eliminate these suspicions. If the desquamative and symptomatic picture persists, the suspicion of LP, PV, and MMP will become greater.

The tissue sample obtained for analysis using the proposed technique does not represent a conventional biopsy due to its limited extension to the epithelium. On the other hand, epithelial cells remain in an architectural arrangement that allows for a superior microscopic evaluation looking for the diagnosis, with advantages over the exfoliative cytology, which represents the other noninvasive method currently available as an alternative to biopsy. The collected material also allows a better comprehension of the relationship among the epithelial cells as compared to cytological smears. Some authors have incisively showed the inefficacy of cytology diagnosing DG.

It is noteworthy that the proposed diagnostic method has not been published yet, and, despite its simplicity, it should be clarified to the pathologist who will receive the material. Thus, to use this proposed minimally invasive method, clinicians need to provide precise information to pathologists regarding the collected sample and the desired analysis. The technique provides a small tissue sample, but it is sufficient for the diagnosis when correctly processed. At the laboratory, this “pellicle” should be carefully included with its lateral facing down so that it is possible to assess under microscopy...
if there is a full-thickness epithelium, with a preserved basal layer (MMP), or if there is a partial-thickness epithelium with Tzanck cells (PV). Cases with negative Nikolsky’s sign (does not bubble or flayed after testing) require conventional intervention, which consists of incisional biopsy [like observed in Figure 1h and i] that can only be performed under the technical conditions of a surgical procedure and availability of surgical materials.

The biopsy is still the gold standard for the diagnosis of oral diseases that manifest DG, and all cases presented here were further evaluated with a biopsy to didactically confirm the initial diagnosis indorsing this minimally invasive method. Biopsy will be necessary for LP and for all cases where Nikolsky’s test did not blister. The biopsy is usually performed in the perilesional regions to avoid a region without epithelium. The proposed technique is also performed on the margin of ulcerated or erythematous areas, thus ensuring the existence of epithelium in the region. The conjunct of microscopic epithelial findings is required and sufficient for the diagnosis of PV and MMP. Thus, the minimally invasive method proposed here is promising, with some advantages over conventional biopsy: ease making and minimal trauma, not being restricted by systemic conditions unfavorable to surgery, or lack of material for surgical procedures. It is also possible to apply direct immunofluorescence to the samples, which is an advanced laboratory evaluation that evidences the relationship between autoantibodies and epithelial cells. On the other hand, if the sample is not well packaged and the laboratory procedure is performed delicately, the work may be lost and the sample will be insufficient for diagnosis.

CONCLUSION

The proposed method seems to be an ancillary in-office approach, which is simple, quick, and minimally invasive, with possible application in daily consult, teaching, campaigns, and for patients with local or systemic immediate restrictions for surgery (biopsy). The proposed way of collecting material for histopathological examination is likely to allow more dentists and doctors to advance in the diagnostic evaluation of DGs. This procedure might provide a better sample for microscopic evaluation than cytology smears. The sampling of the membranous tissue that would be discarded after the Nikolsky’s test, promotes a good chance of diagnosis without the need for a subsequent biopsy, feasible when diagnosing diseases such as PV and MMP. Thus, favoring early diagnosis and early intervention, reducing patient suffering, and improving the prognosis. These are promising preliminary results, and we expect that once this technique is applied in a broad number of cases, additional data about its sensitivity and specificity will be provided.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that names and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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