

## Surgical procedures performed at the periodontal clinic, Lagos University teaching hospital, Nigeria”.

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### Abstract

**Aim:** To highlight the scope and outcome of surgical procedures performed at a periodontal clinic in Nigeria and to stimulate a rethink on Pericoronal Flap Gingivectomy (PFG). **Methodology:** All systemically healthy surgical patients seen at the periodontal clinic of the Lagos University Teaching Hospital were included. A history of any debilitating illness such as uncontrolled diabetes mellitus excluded patients from the study. Age and gender comparisons of outcome were made. Ten modalities were employed. Asepsis was observed. Wound closure was done with silk suture. Periodontal dressing was applied. Chlorhexidine mouthwash, analgesics and antibiotics were given. A 24-hour review appointment was given. Dressings and sutures were removed at the 1 week postoperative appointment. **Results.** Forty-five patients, 29 (64.4%) females and 16 (35.6%) males were treated utilizing ten periodontal surgical modalities that included 16 (35.6%) PFG, 8 (17.8%) gingivectomies and 12 (36.7%) flap procedures The rest were periodontal plastic surgeries and regenerative procedures. Twenty nine (64.4%) of the patients treated were 34 years old or below. **Conclusions:** Pericoronal Flap Gingivectomy (PFG) was the most commonly utilized periodontal surgical procedure. The outcome of periodontal surgical procedure was generally favourable. Plastic and aesthetic techniques had unfavourable outcomes.

**Key words:** Periodontal, Surgery, Lagos

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### Introduction

Modern periodontics is greatly limited by the scarcity and cost of materials and manpower. This limitation is a great challenge to periodontists practicing in developing nations like Nigeria. Management of chronic periodontitis traditionally commences with non-surgical therapy, now called soft tissue management (1). Surgical options are usually adopted either due to failure of initial therapy to produce resolution of disease or where osseous defects, furcation lesions or mucogingival (plastic / aesthetic) deformities or problems make surgical intervention unavoidable.

Treatment of chronic periodontitis utilizing closed (non-surgical) techniques often heals with the formation of an unstable long junctional epithelium (2), though one study in monkeys (3) has shown that long junctional epithelium may be as resistant to plaque infection as connective tissue attachment.

Surgical options adopted in periodontics primarily aim either at creating access for open debridement or at solving muco-gingival problems. Some of the modalities presented here

have been well documented in the literature. Gingivectomy has been performed using several techniques [incision, electrosurgery, chemosurgery (obsolete)], the latest being laser gingivectomy (4, 5). Only gingivectomy using incisions with a scalpel was utilized in the current study. The undisplaced flap (6) is about the commonest used flap technique (2) while the modified Widman flap is utilized to get an added advantage of producing an intimate postoperative adaptation of healthy collagenous connective tissue to tooth surfaces (7, 8). On the other hand, the laterally displaced flap is used in the correction of isolated gingival recession (9) while the apically positioned flap is utilized in creating an increased zone of keratinized gingiva, in pocket elimination as well as in crown lengthening. Frenectomy (2) is often performed on the request of the orthodontist in the treatment of midline diastema while biopsies are usually for investigative purposes. Finally, Guided Tissue Regeneration (GTR), is employed to produce new periodontal attachment through a technique that excludes the fast growing epithelium, thus allowing the relatively slower connective tissue to grow and reattach to root surfaces (10-12).

The extent to which patients benefit from the wide range of periodontal surgical procedures is largely limited in our environment by cost and the availability of materials and manpower.

There is a dearth of literature on the scope and outcomes of periodontal surgeries performed in Nigeria. This might be as a direct consequence of a serious lack of specialists in Periodontology in Nigeria. Moreover, operculectomy has been seriously jettisoned as a treatment modality for recurrent pericoronitis due to supposed recurrence of the pericoronal flap. This study aimed to highlight the scope and outcome of surgical procedures performed at a periodontal clinic in Nigeria and to stimulate a rethink on Pericoronal Flap Gingivectomy (PFG).

#### Study participants and Methods.

Biodata of periodontal surgical patients were obtained and recorded over an eighteen month period, followed by a 6- month observation period. All systemically healthy periodontal surgical patients seen at the periodontal clinic of the Lagos University Teaching Hospital were included in the study. A history of any debilitating illness such as uncontrolled diabetes mellitus excluded patients from the study. Age and gender comparisons were made. Favourable outcome was regarded as complete resolution of clinical signs and symptoms and gain in clinical attachment without relapse for at least one year post operatively. For plastic procedures, favourable outcome was regarded as achievement of function and pleasing aesthetics which remained stable at least 6 months post operatively.

Outcomes were thus recorded and compared.

#### Patient selection

Forty-five periodontal surgical procedures were performed. Ten periodontal surgical modalities were utilized namely- Pericoronal Flap Gingivectomy (PFG), gingivectomy, gingivoplasty, inverse bevel gingivectomy, frenectomy, replaced flap, laterally displaced flap, apically displaced flap, excisional biopsy and guided tissue regeneration(GTR). The procedures were performed by the authors using standard periodontal surgical principles guiding patient selection, asepsis, incisions, tissue management, flap closure and prevention of post-operative complications. For PFG, any existing pocket was excised along with the pericoronal flap. The flap designs employed include the envelope flap, the three-sided flap,

and the modified Widman flap. All flaps raised were full thickness muco-periosteal flaps. Wound closure was carried using black silk suture after achieving haemostasis. A non-eugenol periodontal dressing was used for wound dressing. A course of antibiotics and analgesics was generally prescribed after the procedures and the patients reviewed in 24 hours after being given post-operative instructions. Dressings and sutures were removed at the 1 week postoperative appointment in all cases. All surgeries were performed by rspecialists in periodontics under the same setting. Evaluation of treatment outcome was clinical.

#### Data analysis:

Epi-info (version 6) Statistical software (13) was used for data analysis where applicable. Most data were presented as simple percentages due to small numbers. Data were expressed as tables and figures.

#### Ethical issues

Patients received full explanation of the indication, extent and possible complications and /or side effects of procedures. Informed (verbal) consent thus obtained, the patients were instructed in homecare to minimize complications. All consent unfortunately was verbal as the clinic lacked a definite written consent form. Specific ethical approval was not sought since it was a record of simple routine treatment which would have been carried out with or without the research.

#### Results

Twenty-nine (64.4%) females and 16 (35.6%) males were treated. No gender differences existed with flap procedures (Table 1). Ten periodontal surgical treatment modalities were utilized.

**Table 1: Age distribution of subjects**

Age (years)	n	%
16-24	18	40.0
25-34	11	24.4
>35	16	35.6
Total	45	100

Indications for the surgeries were; recurrent pericoronitis (PFG), orthodontic requests for space closure (frenectomy), gingival recession (laterally displaced flap), deep periodontal pockets (replaced flaps), restorative requests for crown lengthening (apically displaced flap),

(Table 2). Twenty-nine patients, 34 years and below made up 64.4% of all patients treated. Nine (56.3%) of all PFG patients were aged 24 years or below. Sixty seven percent of patients,

who received flap procedures were 35 years of age and above. Eighty percent (4 cases) of frenectomies were performed on patients below 35 years of age (Table 3).

**Table 2. Indications for periodontal surgical procedures performed**

Indication	Treatment Modality	Number	%
Recurrent Pericoronitis	PFG (Operculectomy)	16	35.56
Gingival abscess, Pocket-Excessive Gingival Display-Periodontal Pocket	Gingivectomy (n = 6) Gingivoplasty (n = 1) Inverse Bevel gingivectomy (n = 1)	8	17.78
Orthodontic, Gingival Recession	Frenectomy	5	11.11
Deep Periodontal Pockets	Replaced Flap	8	17.78
Gingival Recession	Laterally Positioned Flap	2	4.44
Crown Lengthening	Apically Positioned Flap	2	4.44
Tumors	Excisional Biopsy	3	6.67
Deep Pocket	GTR	1	2.22
	Total	45	100

Outcome of Guided Tissue Regeneration and Laterally positioned flap was unfavourable while that of frenectomy and PFG (Operculectomy) were highly favourable (100% and 94% respectively). Cumulatively, the outcome was favourable in about 90% of cases. (Tables 4 & 5).

**Table 3: Periodontal surgeries performed by gender**

Treatment Modality	Males		Females	
	n	%	n	%
Operculectomy (16)	6	37.5	1	62.5
Gingivectomies (8)	2	25.0	6	75.0
Frenectomy (5)	2	40.0	3	60.0
Flap procedures (12)	6	50.0	6	50.0
Excisional Biopsy (3)	0	0.0	3	100.0
G T R (1)	0	0.0	1	100.0
Total 45	16	35.6	2	64.4
			9	

$X^2 = 0.11$ ,  $df = 1$ ,  $P$  - value = 0.74. (Rows 1 and 2 were collapsed and then 3, 4 and 5 collapsed for the purpose of analysis).

**Discussion**

Outcome of most of the surgical procedures appear encouraging but should be interpreted cautiously considering the small sample size.

Twenty-nine (64%) of the patients operated were female despite the fact that males suffer more

periodontitis than females (14, 15) and that females have better oral hygiene (16, 17).

Though not Nigerian studies, the effects are largely similar. The female domination in this report is however connected with the greater number of females seeking periodontal plastic and aesthetic procedures and not necessarily more periodontitis in females (Figure 1). The differences were however not statistically significant (Table 3). The age group with high prevalence of pericoronitis also showed a female domination in gingivitis (16, 17).

Patients aged 34 years or below, formed about 64.4% of all cases treated. This is, however, due to the larger number of young patients seeking Pericoronal Flap Gingivectomy (PFG). Such patients were mostly (56.25%) in the 16 to 24 years age range. This age range coincides with the post puberty increase in gingivitis experience, including pericoronitis (17, 18). The age range also coincides with the expected eruption period of the lower third molar (19).

A wide range of periodontal surgical options were utilized in the period under review. Pericoronal Flap Gingivectomy (PFG) is suggested here as a preferred term for the procedure formerly called operculectomy because Operculectomy is gingivectomy of the Pericoronal flap (20) and in our opinion PFG is a more precise and more descriptive term than operculectomy. Pericoronal Flap Gingivectomy

(PFG) was the single most frequently performed periodontal surgery during the period under review (Figure 2). It is, however, considered here as a separate entity for emphasis. It accounted for

about 36% of all periodontal surgeries under discussion. It is indicated for the treatment of recurrent pericoronitis uncomplicated by severe impactions or malocclusion.

**Table 4: Periodontal operative modalities by age range**

Age range (yrs)	PFG (Operculectomy)		Gingivectomy		Frenectomy		Flaps		Biopsies		GTR		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
16-24	9	20.0	3	6.7	3	6.7	2	4.4	1	2.2	0	0.0	18	40.0
25-34	4	8.9	1	2.2	1	2.2	2	4.4	2	4.4	1	2.2	11	24.4
35-44	3	6.7	2	4.4	0	0.0	4	8.9	0	0.0	0	0.0	9	20.0
≥45	0	0.0	2	4.4	1	2.2	4	8.9	0	0.0	0	0.0	7	15.6
Total	16	35.6	8	17.7	5	11.1	12	26.6	3	6.6	1	2.2	45	100.0

Opinions differ quite sharply on the treatment of recurrent pericoronitis. Some authors have advocated extraction of the opposing (maxillary) third molar, (14, 21) This in our opinion appears to overemphasize trauma from the maxillary third molar as an aetiological factor for pericoronitis of the mandibular third molar. All cases seen in this study were treated by Pericoronal Flap Gingivectomy (PFG) alone. A favorable outcome in 94% of cases probably suggests that extraction of the maxillary third

molar in the treatment of pericoronitis is unnecessary except in cases complicated by malocclusion. Recurrence of the pericoronal flap often given as a reason to discard this procedure was rare in our experience during the period under review.

Again, four (80%) of frenectomies were for orthodontic space closure while 1 case was for correction of gingival recession (Figure 3).

**Table 5: Relative outcome of periodontal surgeries**

Treatment Modality	Favourable		Unfavourable	
	n	%	n	%
(PFG) (Operculectomy)(16)	15	93.8	1	6.3
Gingivectomy (8)	7	87.5	1	12.5
Frenectomy (5)	5	100.0	0	0.0
Replaced Flap (8)	7	87.5	1	12.5
Laterally positioned Flap (2)	0	0.0	2	100.0
Apically positioned Flap (2)	2	100.0	0	0.0
Excisional Biopsy (3)	3	100.0	0	0.0
*GTR (1)	1	100.0	0	0.0
Total (45)	40	88.9	5	11.1

\* = Guided Tissue Regeneration.

Expectedly, 67% of flap procedures were performed on patients 35 years of age and above. This age range is associated with more periodontitis than younger people (19, 22, 23). Outcome of flap procedures (Figure 4) appeared encouraging. The single unfavourable outcome for replaced flap procedure was actually in a heavy smoker. The small number of individual treatment modalities however makes it imperative to interpret the results with caution.

Apically displaced flap and frenectomy had a 100% favourable outcome.

The 94% favourable outcome in PFG calls for a rethink on this procedure as an obsolete surgical modality. It calls for more research. Unfavourable outcome in all cases of laterally positioned flap is a great challenge to the operator. The two cases of laterally positioned flap were classified as Miller's class III (24). The

distinguishing features of these classes relate to the presence of interdental alveolar bone and relationship to the mucogingival line. These criteria for classification and the distinguishing features between Miller's classes III and IV gingival recessions seem in our opinion to be prone to subjective interpretation. In essence the unsuccessfully treated cases of Miller's class III could actually have been Miller's class IV (Figure 5). In Miller's class IV, no coverage is expected using traditional techniques like laterally positioned flap (24, 25). It could of course also have been a poorly treated Miller's class III, in which case these patients could have benefited either from a free gingival graft combined with apically positioned flap in a two – stage procedure (26). Guided tissue regeneration techniques (24, 25) are also an option. As a last resort the patient could also have benefited from a prosthetic gum – shield made from clear acrylic (27). Keeping pace with scientific advances in Periodontology is quite challenging in a depressed economy.

The clinical relevance of this study lies in its evaluation of PFG as a treatment modality for recurrent pericoronitis. This is important because it continues to be a reason why many patients visit the periodontal clinic in our environment.

#### **Conclusion**

From this study, Pericoronal Flap Gingivectomy (PFG) was most frequently utilized as a treatment modality for uncomplicated recurrent pericoronitis. Aesthetic procedures had a poor outcome while flap procedures were generally favourable.

#### **Recommendations**

Pericoronal Flap Gingivectomy (PFG) needs to be re-visited and re-evaluated as a treatment option for recurrent pericoronitis. Extraction of maxillary third molars appears unnecessary in the treatment of most cases of recurrent pericoronitis of the mandibular third molar. This study should be replicated using a larger sample

size and there is an urgent need for greater funding of healthcare in Nigerian Hospitals in order to make more options in dental and general care available to the public.

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A surgeon, an architect and a politician were discussing which of their professions was the oldest. “Mine, certainly”, said the surgeon, ‘for it was inaugurated by God when he removed man’s rib to make woman.’

“But before making man and woman,” the architect said, ‘he had to be an architect to give form to the creation, producing it from chaos”

“Exactly, ‘said the politician, ‘and who made chaos?”