Table 1. PICO (T/S) format

Patient/Problem	**Patients in the retention phase of corrective orthodontic treatment**
Intervention	Circumferential supracrestal fiberotomy
Comparison	Control group in retention phase of corrective orthodontic treatment
Outcome/Result	Decreased post-treatment relapse and stability of periodontal tissue condition, with follow-up longer than or equal to 1 year

Table 2. Checklist to assess the methodological quality of the studies

Checklist - Variables to evaluate	
Selection	1. Sample size calculation 2. Representativeness of fiberotomy and periodontal status (experimental group) 3. Selection of patients with no fiberotomy (control group) 4. Determination/evaluation of orthodontic conditions 5. Clear description of surgical procedure 6. Training/calibration of evaluators of clinical/radiographic/cephalometric results 7. Prospective data collection and description of inclusion/exclusion criteria
Comparability	1. Comparability of groups (patients) on the basis of the design or analysis 2. Management of confusion factors (data collection)
Outcomes	1. Evaluation of orthodontic outcomes 2. Determination/criteria applied to assess orthodontic conditions 3. Adequate follow-up of patients
Statistics	1 Relevance/validity of statistical analysis 2. Unit of analysis (response rate) recorded in the statistical model

Adapted version (Chambrone et al, 2013a, 2013b, 2013c) of the Newcastle-Ottawa Scale

Table 3. Methodological score scale

Range	**Quality**
8 or less	Low
8-10	Moderate
11-14	High

Table 4. Databases

DATABASE	**TOTAL ARTICLES**
EMBASE	Found: 43 Selected : 1 Discarded: 42
PubMed	Found: 38 Selected: 19 Discarded: 19
OTHER SOURCES OF INFORMATION	
Citations of other articles	Selected: 1
Grey literature	Selected: 3
Total Selected by title	24

Table 5. Characteristics of the studies included (observational studies)

Author	*Participants*	*Methods*	*Results*	*Conclusions*	*Notes*
Rye W. et al (1983)[16]	48 patients, 164 teeth. 91 teeth in control group and 73 teeth in experimental group (CSF). All teeth had retention between 6 months and 2 years. Age: not reported	Retrospective study taken from the UW University Orthodontic Clinic, Seattle (USA) T1: Pretreatment T2: Post-treatment T3: Post retention longer than 2 years.	The average percentage of rotational relapse was significantly different between the control group (39.0%) and the experimental group (22.8%) with a value of $p \leq 0.01$	Fiberotomy reduces the potential for rotational relapse by removing displaced gingival fibers.	There does not seem to be a difference in relapse potential between arches or types of teeth. There does not seem to be a relationship between the degree of rotation and the % of relapse.

Table 6. Characteristics of the studies included (interventional studies)

Author	Participants	Methods	Clinical parameters	Results	Conclusions	Notes
Hansson C. et al. (1976)[13]	27 patients, 30 rotated teeth, age range from 9 to 22 years. Retention period 8.3 months. Control group (contralateral tooth) and experimental group (Fiberotomy).	Split-mouth study, measuring Silness and Loe's plaque and gingival index and gingival sulcus depth T1: Pre-surgery. T2: 17 months post-surgery.	Plaque Index: 0 = Absence of plaque in the gingival area 1 = Plaque film adhered to gingival margin and adjacent to tooth area. 2 = Moderate accumulation of soft deposits with no periodontal pocket 3 = Abundant white matter inside the gingival sulcus Gingival Index (Silness and Loe) 0 = Normal gingiva 1 = Mild inflammation 2 = Moderate inflammation 3 = Severe inflammation Depth of the gingival sulcus: Measured from the gingival margin to the bottom of the gingival sulcus at 6 points in each tooth: 3 buccal and 3 lingual.	The plaque index and the gingival index showed no statistically significant differences among treated and untreated teeth with respect to the three measured areas (buccal, lingual and mesial). The average marginal sulcus depth measured in buccal and lingual showed no significant differences among teeth in the same jaw.	No significant differences were found when comparing rotated teeth treated with fiberotomy and teeth without fiberotomy in the same jaw.	The results were obtained by different dentists. Relapse was not evaluated.

Edwards, 1988[12]	320 patients, 160 of whom were from the control group without fiberotomy, with Hawley plate only, and 160 from the experimental group with fiberotomy and Hawley plate. Age range from 10.9 to 14.1 years. Average age, 12.2 years.	Controlled clinical trial. Little's irregularity index, epithelial adhesion level and keratinized gingiva band were measured. T1: Orthodontic treatment start. T2: Completion of active treatment and retention initiated. T3: 4-6 years post active treatment. T4: 12 to 14 years post active treatment.	Little's irregularity index measured as the linear displacement of the anatomical contact points of the maxillary and mandibular incisors. Epithelial adhesion level and keratinized gingiva band, using the North Carolina probe.	In the long term, the control group proved to be less successful in relapsing the anterior segment in both maxilla and mandible. In the control group, the average maxillary relapse at T4 was 49.80%, and 53.55% in the mandible. In the experimental group, the average maxillary relapse at T4 was 20.80% and 34.97% in the mandible. There were no statistically significant differences in epithelial adhesion and keratinized gingiva in either of the two groups at T2.	The relapse measurements at T3 and T4 in the experimental group support the hypothesis that relapse is inherent to supracrestal fibers compared to other factors 4 to 6 years after orthodontic treatment. No clinically significant alteration in epithelial adhesion level was found 6 months after the surgical procedure. The CSF procedure may be more efficient in relieving pure rotation relapse than other types of dental movements.	

Tanner et al (2000)[11]	23 patients. Experimental group = 11 patients; control group = 12 patients. Age range: 16.3 years in the experimental group; 15.8 years in the control group	Experimental study (control group with Hawley plate and experimental group with fiberotomy). Crowding was measured with Little's Irregularity Index. Cephalometries were taken at 4 times: T1: Start active treatment T2: End active treatment T3: 6 months of retention T4: 1 year of retention Periodontal probing was conducted to measure sulcus depth before and after treatment. In addition, gingival recession, periodontal pocket formation, and loss of epithelial adhesion level were evaluated. The longest follow-up time was 1 year.	Little's irregularity index measured as the linear displacement of the anatomical contact points of the maxillary and mandibular incisors. The parameters of periodontal status assessment were taken before and after the surgical procedure.	There were statistically significant differences in terms of relapse at T4 in both the experimental group and control group. The experimental group had 63.06% average relapse in the mandible and 25% in the maxilla. The experimental group had 1.5% average relapse in the mandible and 1% in the maxilla. There were no significant alterations in the level of epithelial adhesion. The sulcus depth measured with a periodontal probe remained unchanged from T1 to T2 and T3, and the area of adhered gingiva showed no changes in width after the surgical procedure.	In the fiberotomy group there were minimal changes in irregularity index after brackets removal. In the control group there was a significant increase in terms of Little's irregularity index in both the maxilla and the mandible. Crowding increases regardless of treatment type in patients with and without orthodontic treatment, as a result of the normal aging process.	

Wang Z et al (2003)[7]	81 patients in the control group and 48 patients in the experimental group. Age range: 11.5 to 15 years. Average 13.07 years.	Randomized clinical trial. The control group had 81 patients with Hawley plate. The experimental group was divided into two groups: 23 patients with fiberotomy + stripping + Hawley plate and 25 patients with fiberotomy + Hawley plate. 3 times were taken: T1= Pretreatment T2 = At the end of orthodontic treatment T3 = Retention phase	Little's irregularity and intercanine width were evaluated.	Irregularity increased across all groups at T2 and T3, being significantly greater in the control group between T2 and T3. ($p < 0.05$). The average relapse rate of the control group was higher compared to the experimental group. The average relapse rate in the experimental group reduced by a 21.61% compared to the control group (14,23% in the maxilla and 28.99% in the mandible). Periodontal tissue is not compromised when performing the fiberotomy procedure.	Modified supracrestal fiberotomy may be effective in relieving relapse of crowding and rotations of anterior teeth. Combined fiberotomy and stripping treatment can help maintain post-retention stability of anterior mandible teeth.	For results analysis purposes, only the experimental group with fiberotomy was taken in order to eliminate potential confusion biases.

Tabla 7. Evaluation of the studies' methodological quality

Variable		Tanner et al, 2000[11]	Edwards, 1988[12]	Hansson C. et al, 1976[13]	Rye W. et al, 1983[16]	Wang Z et al, 2003[7]
Selection	1. Sample size calculation					
	2. Representativeness of experimental group					
	3. Selection of control groups	*	*			*
	4. Assessment of orthodontic conditions	*	*			*
	5. Clear description of surgical procedure	*	*	*		*
	6. Training/calibration of evaluators		*	*	*	
	7. Prospective data collection and description of selection criteria		*	*		*
Comparability	1. Group comparability (patients)	*	*	*		*
	2. Management of confusion factors					
Results	1. Evaluation of orthodontic results		*			
	2. Criteria applied to assess orthodontic conditions	*	*	*		*
	3. Adequate follow-up of patients	*		*		*
Statistics	1 Relevance/validity of statistical analysis	*	*	*	*	*
	2. Unit of analysis (response rate) recorded in the statistical model	*	*	*	*	*
Total		**8**	**10**	**8**	**3**	**9**