Soft Tissue Trimmers- A Review

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KEYWORDS

ABSTRACT

Soft tissue trimmers are specialized rotary instruments designed for precise and minimally invasive soft tissue contouring in periodontal and restorative procedures. They serve as an effective alternative to scalpels and electrosurgery, offering controlled tissue removal with reduced bleeding and enhanced healing. Operating at lower speeds, these instruments minimize heat generation, thereby decreasing tissue trauma and patient discomfort.

Soft tissue trimmers play a crucial role in various clinical applications, including gingivectomy, gingivoplasty, crown lengthening, gingival depigmentation, and interproximal tissue management. Their precision enables accurate gingival reshaping, improved aesthetic outcomes, and optimal soft tissue adaptation around restorations. Additionally, their hemostatic effect often eliminates the need for sutures, further streamlining surgical procedures.

Advancements in dental instrument technology have positioned soft tissue trimmers as essential tools for enhancing surgical efficiency, improving patient recovery, and achieving superior clinical outcomes. Their growing adoption underscores their significance in modern periodontal and restorative dentistry.

INTRODUCTION-

The term "bur" in dentistry refers to a class of rotary cutting instruments featuring bladed heads, meticulously engineered to remove tooth structure through either precise cutting or abrasion. Bur facilitates two fundamental techniques in periodontal surgery--soft-tissue debridement and root planing.(18) The bur debrides granulation and other soft tissues attached to the root or bone and removes hard deposits from root surfaces. It can also be used as an adjunct while performing crown-lengthening procedure, gingivectomy, depigmentation and endodontic surgery.

TYPES OF SOFT TISSUE BURS-

- Carbide (8)

Fig-1 Fig-2

A # 2 round bur was used to draw the outline of the pigmented lesion and # 6 round bur was used for abrasion

• Diamond abrasive (3,4,6,7,9,10,11)

Fig-3

Fig-4

Fig-5

Coarse and medium coarse or hyperfine diamond coated abrasive points are used.

Round, flame, needle shaped points are used.

• Acrylic rotary abrasive (1)

Made of micro grained Aluminum oxide grits

Fig-6

• Ceramic

Fig-7

Fig-8

Fig-9

Available as-

Product	Brand	Material
Ceratip	Komet ,USA	Zirconium oxide
Precicut	DFS,Germany	yttrium-stabilized nano-structure zirconia
Meisinger Gingival Trimmer	Neuss, Germany	zirconia

Types of bur shapes available-
- Round
- Straight
- Oval

• Stainless steel

Fig-10

Fig-11

Fig-12

Made of stainless steel, are available in cylinder and round shape by gingiburs and thermacut burs

History-
In 1891, the S.S. White company introduced the first machine-made steel burs, known as revelation burs.

PROCEDURE: -

• Depigmentation

Diamond abrasives

A spray of saline was constantly directed on the rotating points during their use. An accelerated speed ensures a smooth, rapid operation, while the stream of saline provides a temperature control and it prevents clogging of the burs. (3)

Fig-13

Bur abrasion is performed with feather like brush motion under copius saline irrigation (7)
Bur abrasion with a sharp ending diamond bur or a hyperfine round bur is better for complete removal of pigmented lesions. (8)
When the de epithelization is performed with a highspeed diamond procedure, it is recommended to use the largest size, of diamond bur. small burs cannot make smooth surfaces easily and have a tendency to make small pits in the surgical sites which require further correction (10)
The speed of healing with the diamond bur abrasion technique is relatively faster than the Er: YAG laser technique. (11)

Bur abrasion (II quadrant) on the contralateral side after scalpel de-epithelization. Patients' acceptance of the procedure was good and no repigmentation was reported till 12 weeks period (12)

Fig-14

HISTORY
In 1897, the first diamond dental bur was developed by Willman and Schroeder in Germany, marking a significant advancement. This early diamond bur was created by embedding diamond powder into soft copper

or iron blanks. In 1942, diamond cutting instruments with 5000 rpm were introduced. In 1947, Carbide Burs with 12,000 rpm replaced the
steel burs Further innovation in 1932 by W.H. Drendel led to the modern diamond bur, where diamond points were bonded to stainless steel shapes. (15)

• Carbide bur

Abrasion under water spray was performed with highspeed handpiece and round carbide bur until whitish connective tissue was exposed .Bur abrasion reported faster epithelization and healing and less pain compared to the Er:YAG laser.(8)

Fig-15

Acrylic rotary Abrasive (1)

A highspeed hand piece with an acrylic rotary abrasive was used to remove the pigmented layer.
The patient had no complaints of postoperative pain or sensitivity. The healing process was normal and discomfort was reported.

Fig-16

• Ceramic bur

Fig-16

Cerabur(komet USA) was used in a high-speed handpiece at full RPM (Rotation Per Minute) without water coolant to remove the epithelial layer, excise and contour the gingival soft tissues. The heat produced by the bur due to friction resulted in immediate tissue coagulation and minimal bleeding. During the procedure, the gingiva as well as the Ceramic bur were cleaned from gingival debris by sterile gauze soaked with saline. (22)


Fig-17

A ceramic soft tissue trimmer bur (DFS Diamon Precicut® tissue trimmer,Germany) was utilized at high-speed 300,000 rpm without water coolant spray, according to the manufacturer's guideline and previous works, to eliminate the whole epithelium and a layer of connective tissue. Saline irrigation was then applied to the exposed surface. (23)


Fig-18

ceramic bur (Ceratip) which was made of a mixed ceramic (zircondioxide oxide partly stabilized by yttrium and aluminium ceramic), was operated in the high-speed mode without cooling to preserve the thermal coagulation action, causing blood vessels to seal for minimal bleeding.(24)

Limitations-difficulty remains in controlling the depth of de-epithelization and obtaining an adequate access.
Disadvantages:
• Technique sensitive
• Post-treatment pain
• High recurrence rate.
• Exposure of underlying alveolar bone can occur with high speed and/or increased pressure
• mechanical abrasion with a rotary round bur enabled clear observation
and a distinctive endpoint of epithelial elimination because
there was no carbonization or protein coagulum formation caused by laser usage. (8)
Advantages:
• Minimal post operative pain.
• Inexpensive
• Reduced intraoperative bleeding
• Enhances wound healing

Gingivectomy:
Soft tissue trimming burs made up of stainless steel or ceramic have been used for excision of gingival tissue or gingivoplasty.

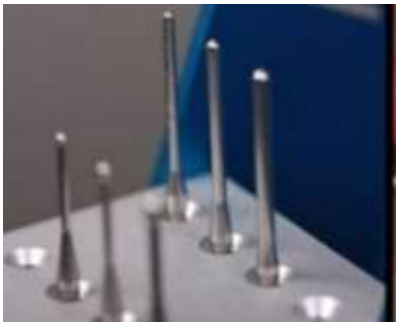

Fig-19 Fig-20 Fig-21

Gingivectomy was carried out using Gingiburs (Smart ROTO, Germany) and further hemostasis was obtained with Viscostat haemostatic agent. (16)
A thermacut bur mounted on a high-speed 1:5 contra-angle handpiece (Joy Dental, China) was used to cut the papilla at a 90 degree angle and without coolant to acquire deep subgingival margin (21).



Fig-22 Fig-23 Fig-24

Occlusal view showing papilla removal using thermacut bur

• Degranulation

Fig-25

-the rotary instruments, Desmoclean (Hager, Germany) carbide burs with non-cutting, elliptical, and hexagonal head were used with micro-motor contra-angle handpiece at 8000 rpm (rotation per minute) with light pressure and water spraying. Clinical improvement was noticed in both moderately deep pocket sites and deep pocket areas. (17)

-Evian Debridement bur(18)

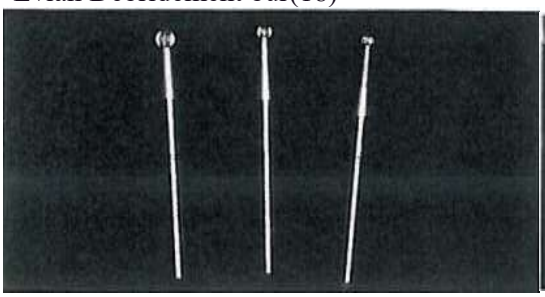

Fig-26

Figure 2—SEM of the #6 round Evian Debridement Bur. Note the blunt nature of the flutes.

Fig-27

Fig-28
Pre-Operative view

Fig-29
post-operative view after debridement

-EthOss Degranulation bur (Strauss&Co,USA)

Fig-30

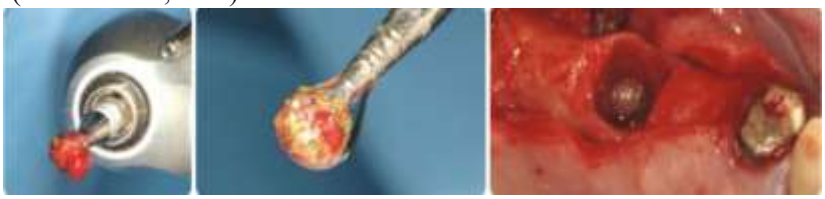

Fig-31

-Other applications
- Implant placement
- Crown lengthening procedure
- Periapical surgery

INDICATION FOR SOFT TISSUE TRIMMERS:
- Gingivectomy
- Depigmentation
- Sulcus dilation for crown core preparation
- Exposing impacted teeth
- Exposing implants

CONTRAINDICATION FOR SOFT TISSUE TRIMMERS:
- In patients with thin phenotype
- In narrow cervices that risks jamming of the instrument

CONCLUSION-

Soft tissue burs can prove to be an asset when used in various procedures like gingivectomy,depigmentation and degranulation.with respect to various sizes and shapes available,their use can be determined accordingly.the large carbide burs available can be used for removal of calcareous deposits white the smaller ones can be efficiently used in the furcation areas.similarly the straight ceramic burs can be used for

depigmentation and the oval shaped one's are used for implant exposure procedures and.stainless steel burs like thermacut and gingiburs have proved to be useful tools for gingivectomies in the interproximal area.They can provide efficient treatment procedure minimizing time required and also reducing the strain and fatigue to the clinician.acrylic and diamond coated abrasive burs are now not often used because of novel ceramic and stainless steel burs owing to their surface smoothness and better haemostasis.

SOFT TISSUE TRIMMER	RECOMMENDATIONS FOR USE	INDICATIONS
Carbide bur	• 8000-10,000 rpm with light pressure and irrigation	• Degranulation • Depigmentation • Crown-lengthening procedures • Endodontic surgery • Root planing
Stainless steel bur	• To be used without any water / spray-cooling Operation at intervals of 3 seconds 300.000-500.000 rpm	• Gingivectomy • Gingivoplasty
Acrylic bur	• A high-speed hand piece, with feather light brushing strokes without coolant	• Depigmentation
Diamond coated points	• a slow speed, micro motor hand piece with doughnut shaped coarse diamond points	• Depigmentation
Ceramic bur	• high-speed 300,000-450,000 rpm without water coolant spray	• Depigmentation • Gingivectomy • Implant exposure

Table no. 1

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