Purpose: To compare the post-extraction dimensional changes following extraction alone or extraction plus ridge preservation with an intrasocket mineralized freeze-dried bone allograft and a collagen membrane. 2nd purpose is to determine whether there are significant differences between 2 procedures histologically. 3rd one is that a 4-months and 6-month implant placement time was evaluated to determine whether there was any effect on bone quality or implant success rate. 4th objective is to evaluate the effect of a collagen membrane on the soft tissue thickness overlaying alveolar bone as compared to soft tissue thickness following extraction alone.

Materials and Methods: 24 patients (10 males and 14 females, aged 28 to 76 years) who needs implant restoration participated. 12 were randomly selected to receive extraction alone (EXT) or ridge preservation (RP) with FDBA and collagen membrane. Customized acrylic occlusal stents were made on the study casts to serve as fixed reference guides for the vertical measurements. Baseline data including PI, GI, BOP, horizontal ridge width, vertical distance from a grooved stent to the alveolar crest, socket wall thickness, and soft tissue thickness were collected just before surgery and before implant placement. Atraumatic extraction was performed when possible. No attempt was made to primarily cover the extraction socket or collagen membrane. After the extraction w/wo ridge preservation, all subjects were seen weekly until soft tissue closure over the site, them monthly until implant placement. Subjects were given naproxen, 375mg, every 12 hours for 1 week; doxycycline hyclate, 50 mg, 4 times a day for 2 weeks. At the time of implant placement, osseous core was taken with trephine for histological analysis. Data were statistically analyzed.

Findings: There is no statistical significance between EXT and RP group with respect to PI, GI, and BOP. Horizontal Alveolar Ridge Width: RP cases had mean 9.2±1.2 mm that decreased to 8.0 ±1.4 mm, for a statistically significant mean loss of 1.2±0.9 mm. EXT cases presented with a mean width of 9.1 ±1.0 m, which decreased to 6.4 ±2.2 mm, for statistically significant mean loss of 2.6±2.3mm. The difference of decrease between groups was statistically significant.

Vertical Ridge Height: There were statistically significant differences between EXT and RP groups for the buccal, mesial, and distal sites. The palatal/lingual site was relatively unchanged for either group, or no statistically significant difference. Histologic evaluation: EXT sites healed with less total bone and more trabecular space than RP sites. Soft Tissue Changes: Mid-crestal soft tissue healing over the collagen membrane (RP) yielded a gingival thickness of 2.6±0.9mm, while healing over the extraction (EXT) led to a gingival thickness of 2.1±1.3 mm. On the buccal aspect, there was a statistically significant difference between groups, the RP group lost soft tissue thickness, while EXT group gained thickness. However, gingival thickness values between baseline and time of implant placement were not statistically significant.
**Conclusions:** Ridge preservation limited the loss of hard tissue ridge width and provided a gain in hard tissue ridge height when compared to extraction alone.

Purpose: To investigate the relationship between microcirculation and bone resorption/formation after mucoperiosteal flap surgery.

Materials and Methods: 12 adult beagle dogs were used. Before the experiment, a clinically healthy periodontium was retained (PII=0, GI=0). Flap surgery was performed using the maxillary incisors (I1 to I3) on each side. A 6mm longitudinal incision was made distally at I3 to elevate the mucoperiosteal flap. The flap was returned to its position, and the wound was sutured. The experimental periods were 7, 14, 21, and 28 days, and 3 dogs were used for each period. Each specimen was examined by 3 different techniques: LM (light microscope), TEM (transmission electron microscope), and SEM (scanning electron microscope).

Findings:
- Control group: Flat fibroblast-like osteoblasts were arranged on the bone surface. The endothelium adjacent to these osteoblasts was continuous.
- Day 7 after surgery: Marked angiogenesis was observed in flap region. Howship lacunae were formed by osteoclasts. In new blood vessels adjacent to active osteoclasts (ruffled border), the endothelium was extremely thin (20 to 80 nm thickness). Also, many fenestrations (50 to 80 nm diameter) were observed in the endothelium, and the basement membrane was interrupted and irregular. In SEM specimens, developed sinusoidal new blood vessels filled the interstitium of the mucoperiosteal vascular plexus.
- Day 14 after surgery: Activated osteoblasts (tall rounded shape) were founded in resorption cavaties formed by osteoclasts. The endotheliums of new blood vessels were thin, and vesicles (50 to 100 nm diameter) in the endothelium were formed next to the osteoblasts. Also, the fenestrations disappeared. New blood vessels with glomerulus-like morphology consistent with the bone resorption areas were observed in TEM specimens (see the below figure).
- Day 21 after surgery: There was no bone resorption, and laminar formation of new bone was founded. Like day 14 after surgery, activated osteoblasts and formation of vesicles were observed. The new vascular plexus showed a relatively flat surface, compared to that on day 14.
- Day 28 after surgery: The overall alveolar bone surface was flattened by addition of new bone. The density of the new vascular plexus was decreased because of disappearance of new blood vessels and reduction of the diameter of dilated new blood vessels.

Conclusions: In the periodontal healing, the mucoperiosteal vascular plexus changed with the bone remodeling.

Purpose: To retrospectively explore the prevalence of clinical infections post-surgically of multiple surgical modalities in a diverse periodontal practice and to examine treatment variables that may affect infection rates.

Materials and Methods: 1053 periodontal surgeries on 395 pts were reviewed. Pts were not excluded if they received presurgical antibiotics. All pts were ASA class I or II. Infection was defined as increasing and progressive soft tissue swelling with the presence of suppuration. Any unscheduled return in which the provider placed the pt on antibiotics was considered infection. Data was studied to determine the relationship between prevalence of post-operative infection and treatment modality.

Findings and Conclusions: out of 1053 surgeries, there were only 22 infections (2.09 %). Infections involved 19 out of 395 pts. 6 out of 22 (27.3%) occurred in the maxilla and 16 (72.7%). There was no statistical relationship between post surgical infections and any of the treatment variables studied. The use of bone graft or a membrane (resorbable on non-resorbable) did not increase the infection rates. 8 infections occurred in 281 surgeries (2.85%) where antibiotics were used compared to 14 infections in 772 surgeries (1.81%) where antibiotics were not used. When CHX was used there was 1.89 % infection rate compared to 3.27% with no CHX used. The use of surgical dressing increased the infection rate (2.67% with dressing, 1.86% without dressing).

The authors concluded that there is a low rate of post-operative infection following periodontal surgeries. There is no benefit of using antibiotics for the sole purpose of preventing post-surgical infections.

Purpose: The purpose of this article was to evaluate and discuss factors that influence inter-dental/inter-implant papillae and to compare currently available techniques and doing so, present an approach to help clinicians manage or regenerate the inter-proximal papillae.

Materials and Methods: Review of the literature.

Findings and Conclusions: The authors begin by describing the basic anatomy of the gingiva and the inter-dental/inter-implant papilla thus laying the foundation for their discussion of different treatment modalities of papilla preservation/regeneration. They further discuss the concept proposed by Ochsenbein, that the gingival contour is supported by the underlying osseous architecture and the concept of the biologic width described by Gargiulo et al in 1961. However the mere presence of 2 mm of gingival tissue above the alveolar crest does not sufficiently explain the 5 mm of tissue height seen in the region of the interdental papillae. Becker et al. emphasized the concept that a more pronounced gingival scallop showed higher levels of inter-dental bone when compared with a flatter gingival architecture. Cochran 1997 applied the concept of a biologic width having an epithelial attachment of 2mm to implants. However implants lack the crestal bone support that exists between natural teeth or between an implant and a natural tooth. Tarnow et al. examined the presence of the interdental papillae in humans and correlated their presence to vertical height from the base of the contact point to the crest of bone and found that, when the distance from the contact point to the crest of the bone was ≤ 5mm, the papilla was present 98% of the times, while it dropped to 56% when the distance increased to 6mm, and was present only 27% of the times at 7 mm. Tal 1984, Hines & Wieder 1986 studied the lateral distance between two adjacent teeth and the relationship to the presence of an interdental papilla. They concluded that teeth with root proximity of less than 0.5 mm had very thin cancellous bone with a greater risk of resorption, thereby reducing support for the interdental papillae, if this bone was lost. Choquet and Hermans 2001 investigated the presence or absence of the interproximal papilla adjacent to single tooth implants to determine if there is a correlation between the distance from the base of the contact point and the alveolar crest. They found that when the distance form the contact point to the crest of the alveolar bone was less than 5 mm the papilla was present 100% of the times, however when the distance was more than 5 mm, the presence of the papilla was less than 50%. Tarnow et al. demonstrated a direct relationship between the existence of a minimum mesiodistal distance of 3 mm of bone between implants and maintenance of the papilla. Bergstrom 1984 described the length of the papilla from its base to the contact point in relation to the length of the crown of the central incisor and found a ratio of 0.5 indicating that a healthy papilla reaches halfway to the incisal edge of the maxillary central incisor. This ratio was found to be 0.25 for lateral incisors. Kois 2001 correlated the shape of the tooth and its interproximal contact area with the presence of interdental papillae and concluded that square-shaped teeth have a more favourable esthetic outcome compared to ovoid or triangular teeth because of a longer interproximal contact and therefore more interproximal papillary height required to fill the space. Kois 2001 categorized the gingival tissue as being of a thin or thick biotype. He stated that thin gingival tissue has less
underlying osseous support and less blood supply, thereby predisposing it to recession after extraction. Pontoriero and Carneval 2001 stated that thick tissue biotypes have the greatest chance of rebound in a coronal direction following aesthetic crown lengthening. Salama & Salama 1993 advocated orthodontic extrusion, where the supporting interproximal bone follows the extruded tooth and provides support for papillary regeneration. However, teeth positioned too far facially have thin or no buccal bone and hence are not suitable for orthodontic extrusion. Spray et al. 2000 proposed the term “critical bone thickness” representing the facial plate thickness at which changes of bone gain or loss are minimal. They observed that the chance for bone resorption was greater when the facial thickness was < 1.4 mm while the possibility of bone gain was seen at 2 mm thickness. The authors therefore concluded that 2 mm is a critical thickness for the integrity of the facial plate after 2\textsuperscript{nd} stage surgery. Cochran et al 2002 reported that soft-tissue changes such as recession of approximately 1 mm take place in the first year after restorative treatment is performed on one stage implants. Therefore a longer term provisional restoration should be considered prior to final restoration to allow for tissue changes. Norland and Tarnow 1998 developed a classification system for the loss of papillary height and used the facial and interproximal CEJ’s of natural teeth and the interdental contact point as references. Various papillary preservation techniques have been discussed by the authors in this paper as well as restorative attempts to correct the aesthetic challenge. They have developed an aesthetic triangle to serve as a guideline for maintaining and creating papilla. This includes space management for preserving soft/hard tissues, hard tissue assessment, soft tissue assessment and restorative options.

**Purpose:** The main goal of this study was to evaluate the effectiveness of the papilla amplification flap (PAF) in obtaining and maintaining primary soft tissue closure of the interdental space above nonresorbable, titanium-reinforced, expanded polytetrafluoroethylene (e-PTFE) membranes and to quantify the regenerative outcomes obtained using this procedure.

**Materials and Methods:** This study was done as a clinical case series. The surgical technique was developed for areas where MPP (modified papilla preservation) and SPP (simplified papillae preservation) technique cannot be done due to anatomical considerations. For this study 17 systemically healthy, non smoking subjects were selected.

The criteria set for the experimental site were:

a) Presence of a deep interproximal defect with an intrabony component of at least 4 mm.
b) Clinical attachment loss greater than 7mm.
c) Unfavorable anatomic conditions of the defect – associated interdental area.
d) No furcation involvement.
e) Presence of at least 4 mm of buccal keratinized tissue at both teeth neighboring the defect.

Clinical measurements were done pre surgically and post surgically. Data was analyzed for statistical significance.

**Findings and Conclusions:** The application of the PAF in combination with e-PTFE membranes resulted in clinically and statistically highly significant gains in clinical attachment levels (4.7 +/- 1.4 mm) and reductions in probing pocket depth (6.3 +/- 1.3 mm) after 1 year. Primary soft tissue closure of the interdental space was obtained in 100% of cases after completion of the surgery and maintained in 65% of cases during the initial healing period (6 weeks). Results from the present study indicate that the PAF can be considered a suitable soft tissue surgical approach for GTR treatment of intrabony defects when papilla preservation techniques are not recommended because of unfavorable local anatomic conditions interproximally.