Cool Atmospheric Plasma (J-Plasma) and New Options for Facial Contouring and Skin Rejuvenation of the Heavy Face and Neck

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Abstract

Treating patients with heavy or thick features comes with challenges not present in those patients lacking these physical characteristics. The authors report our experience with cool atmospheric plasma for facial contouring and skin rejuvenation of the heavy face and neck including rhinophyma. Cool atmospheric plasma is generated by running helium gas over radiofrequency energy. The resulting plasma is a fourth state of matter and has enhanced clinical effects for ablation and thinning of skin and soft tissues as well of contouring and tightening of deeper soft tissues and fascia. Cool helium plasma has been a very effective tool for skin rejuvenation and skin tightening as well as using it as a tool for nonexcisional microinvasive face and neck rejuvenation. Future research may indicate that it can help treat primary or recurrent superficial cutaneous malignancies.

Keywords

► cool atmospheric plasma
► facial rejuvenation
► skin rejuvenation
► rhinophyma
► basal cell carcinoma

Historical Background of Plasma Technologies in Medicine and Surgery

Historically, plasmas were first employed in a “biological” application in the late 1850s when Siemens used a dielectric-barrier discharge (DBD) to generate ozone and used the ozone to clean water from biological contaminants. The endpoint of collagen contraction and skin tightening occurs in the last phase of wound healing as realignment of collagen bundles permits overall contraction of the soft tissue and skin mass to occur. Skin thickness in many patients is directly attributed to the degree and number of sebaceous units in the skin and this can also be modified by some types of energy-based devices. In contrast to superficial skin tightening, the overall volume changes in superficial or deep fascia and the volume of salivary glands and facial musculature, especially the digastic muscles in the neck. Laxity of neck musculature, especially the platysma, will also contribute to the overall volume of the neck and in some cases, require modifications in muscle anatomy via platysmaplasty to achieve the final aesthetic outcome of improved facial and neck contours. In this article, we will examine the ability of a new class of cold atmospheric plasma (CAP) devices to improve skin tightening of facial, nasal, and cervical skin—especially rhinophyma, and also evaluate the technology’s ability to offer neck and jowl contouring in a manner that is both efficacious and safe. We will also introduce evidence for potential applications for the treatment of cutaneous malignancies.
Credit of first description of plasma is attributed to William Crookes who identified plasma in 1879. Note that 99% of the visible universe is made up of plasma, referred to as the fourth state of matter (►Fig. 1). The other states of matter are liquid, gas, and solid. In 1929, Dr. Irvine Langmuir was the first to apply the word “plasma” to ionized gas. No systematic research was conducted to understand the interaction between plasmas and biological cells until more than 130 years later, in the mid-1990s. In the meantime, some attempts were made to use plasmas for biological sterilization from the 1960s to the 1980s.\(^1\)\(^-\)\(^3\) However, no systematic research was conducted to understand the interaction between plasmas and biological cells until more than 130 years later, in the mid-1990s. Most of these experiments used plasma as a secondary agent in the sterilization process, and no scientific investigations were made to understand how plasma actually interacted with bacterial cells and how it caused their demise. In the early 1990s, a group at Los Alamos National Laboratory studied laser-produced plasmas for medical applications including in ophthalmology, urology, and cardiology.\(^4\) Since this new research topic of biomedical applications of plasmas was at its infancy in the early and mid-1990s, particularly in the case of atmospheric plasmas, not many people in the scientific community were aware of this work and funding was practically nonexistent. This initial funding was provided by the Electronics and Physics Directorate of the U.S. Air Force Office of Scientific Research (AFOSR) under a small business technology transfer program directed by Dr. Robert J. Barker. International Conference on Plasma Science (ICOPS) in 1998 held the first session dedicated to disseminating the first results of a coordinated effort to investigate plasma–cell interactions.\(^5\) In a few years’ time, all major international plasma conferences followed suit. Today, research has expanded to include work on the interaction of plasma with eukaryotic cells, such as mammalian cells, with potential applications in wound healing and in fighting some types of cancers by inducing apoptosis (programmed cell death). These are exciting applications that could take plasmas further into the medical and therapeutic fields and added the biological/medical applications of plasmas to their technical topics’ repertoire.

**Cold Helium (Atmospheric) Plasmas Applications and Device Development**

There are two types of plasma: thermal and nonthermal or CAP. Thermal plasma has electrons and heavy particles (neutrons and ions) at the same temperature. CAP is said to be nonthermal because it has electrons at a hotter temperature than the heavy particles that are at room temperature. In the usual description, the terms CAP and cool helium plasma (CHP) represent the same entity provided that helium gas is used for the generation of the CAP. CAP and CHP will be used synonymously to describe the use of helium-generated CAP. There are several methods to produce CAP, such as DBD, atmospheric pressure plasma jet (APPJ), plasma needle, and plasma pencil. Several different gases can be used to produce CAP such as helium, argon, nitrogen, heliox (a mix of helium and oxygen), and air. Due to the ability of CAP to deactivate microorganisms, cause cell detachment, and cause death in cancer cells, the earliest research on CAP has been in finding uses for CAP in dentistry and oncology. Koinuma et al developed the earliest radiofrequency (RF) cold plasma jet in 1992.\(^6\) The cathode is a...
needle electrode made of tungsten or stainless steel with a 1-mm diameter connected to a RF source (13.56 MHz). The needle electrode lies within a quartz tube, whereas the anode electrode is grounded. Depending on the application, helium or argon were mixed with various gases. This group published several papers describing its variants and applications of the plasma jet.12 In 2002, Stoffers et al created a miniature atmospheric plasma jet that they called plasma needle11 and created a new version in 2004. In the former version, the needle was enclosed in a box and, as a result, the samples had to be placed inside of the box to be treated. In the new version, the plasma needle consists of a 0.3-mm metal strand diameter with a sharpened tip inside of a Perspex tube. The length of the entire needle is 8 cm and 1.5 cm remains uncovered by the Perspex tube. The gas used most frequently is helium due to its high thermal conductivity. The gas is then mixed with air at the needle tip where a microdischarge is created. Gases other than helium are also used.13 The diameter of the plasma glow generated is 2 mm. Microplasma is created when RF power at 13.05 MHz ranging between 10 mW and several watts is applied to the needle. Its small size enables it to be used to treat small areas where accuracy is required. The microplasma device utilized for the patients reported in this article is produced by Bovie Medical Corporation (BMC) and is known as J-Plasma. In 1998, the BMC researcher team had attended a conference in Dusseldorf, Germany, where it came across a plasma-based technology developed in Russia that appeared promising. BMC entered into a joint venture agreement to develop and bring the product to market. In 2007, BMC bought out its partner and continued development on its own. That product became J-Plasma, which utilizes a gas ionization process to produce a stable, focused beam of ionized gas that provides surgeons with greater precision, minimal invasiveness, and an absence of conductive currents during surgery. Once BMC took the development of J-Plasma in-house, the device began coming together. In 2010, the team added J-Plasma’s retractable blade, which allows it to function as a cutting tool that leaves behind almost no tissue damage. By early 2012, J-Plasma had received 510K U.S. Food and Drug Administration (FDA) clearance for cutting, coagulating, and ablating soft tissue. In aesthetics, the most recognized plasma device in recent history was the Rhytec Portrait PSR3 (Rhytec, Inc.) released in 2006 which is a resurfacing device only and does not permit cutting. The Portrait device is nitrogen based and is unique effects. The most important components for biological effects include singlet oxygen (\(^{1}\)O\(_2\)), superoxide (O\(_2^{-}\)), ozone (O\(_3\)), hydroxyl radicals (‘OH) – useful in programmed cell death (apoptosis), nitrogen radicals (N\(_3\)^+), nitric oxide (‘NO) – powerful signaling molecule in inflammation and cellular injury response, nitrogen dioxide (‘NO\(_2\)), peroxynitrite (ONOO^–), hydrogen peroxide (H\(_2\)O\(_2\)) – also useful in apoptosis, organic radicals, electrons, energetic ions, and charged particles (RO^–, RO\(_2^–\)). It is well known that reactive oxygen species (ROS) and reactive nitrogen species (RNS) are able to induce cell proliferation as well as cell death, while extreme amounts of reactive oxygen and nitrogen species (RONS) can induce apoptosis and damage of proteins, lipids, and DNA. These interactions are capable of inducing epigenetic modifications at the cellular level. Oxidative stress, also known as the intracellular redox balance, is the disequilibrium between the ROS and RNS and the antioxidants, caused by a natural physiological process in the biological system, where the presence of these free radicals overpowers the scavenging mechanisms. The uncontrolled production of ROS will eventually interact with molecular structures, such as DNA, proteins, lipids, and carbohydrates, leading to an alteration of the metabolic pathway activity. This effect will cause molecular damage, which will eventually result in the pathogenesis of different diseases, such as cancer, neurodegenerative diseases, and diabetes, as well as aging. Cancer cells in particular are more susceptible to oxidative stress than healthy cells. CAP shows its promising potential to be a selective anticancer tool. Preliminary research over the past decade demonstrated that CAP could effectively inhibit the growth of dozens of cancer cell lines in vitro by mainly triggering apoptosis.15 CAP is also capable of effectively resisting the growth of subcutaneously implanted xenograft tumors in mice by unknown mechanism. The CAP-originated reactive species has been regarded as the primary factors resulting in cell death though physical factors of CAP may also have minor unknown functions. Despite the anticancer molecular mechanism being still far from clear, current studies reveal that the apoptosis of CAP-treated cancer cells in vitro is mainly due to the intense DNA double-strand break caused by a significant rise of intracellular ROS. The differential expression of the aquaporin channels and intracellular antioxidant enzymes such as catalases in cancer cells and normal cells may be a plausible mechanism to control the selective diffusion of reactive species across the cytoplasmic membrane of cancer cells and selective rise of intracellular ROS in cancer cells. Because corresponding homologous normal cells just experience a weak rise of ROS, CAP is able to selectively cause apoptosis in cancer cells in vitro. Cold plasma is currently being studied for the antineoplastic properties and may be useful in treating cutaneous malignancies (± Fig. 2).
Device Overview and Settings

J-Plasma from the BMC represents a new approach to electrosurgery whereby a helium gas plasma, fueled by electrosurgical energy, flows into the application site for only a brief interval then disperses out leaving very precise, predictable effects. There is no net flow of electricity around the body, so no return electrode is required. The cold plasma effect is highly localized, minimizing collateral damage to surrounding healthy tissue (Fig. 3). This and having no need for a grounding pad differentiates J-Plasma from standard electrosurgical devices. CAP/J-Plasma uses nonconductive currents and limits direct injury with its reduced tissue spread, minimizing the risk of direct and capacitive coupling. CAP/J-Plasma's retractable blade (Fig. 4) enables greater versatility and control of the energy, as well as enhanced visibility at the application site. Additionally, CAP/J-Plasma allows for safe and effective tissue coagulation/ablation/incision with controlled precision when ablating tissue and reduced fear of injury to surrounding healthy structures. The thermal ablation zones of CAP/J-Plasma are demonstrated in Fig. 3 and compared with standard current-based electrosurgical ablation zones. The CAP/J-Plasma helium device has minimal lateral and depth of thermal spread in a variety of tissue types and comparisons with different devices and is shown graphically and histologically in Figs. 5 and 6. A comparison of the ablation zones in peritoneum is shown comparing CAP/J-Plasma with conventional electrosurgical devices (Fig. 7). The thermal dispersion of the device increases linearly with increased power setting, gas flow rate, and exposure time in various tissue types. The depth of tissue effect with CAP/J-Plasma ranges from no visible effect to ~2.0 mm with lateral

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**Fig. 2** Patient with a nodular basal cell carcinoma successfully treated with cold atmospheric plasma (CAP)/J-Plasma. Photo courtesy of Joseph Delozier III, MD.

**Fig. 3** More precise thermal ablation zones demonstrated with cold atmospheric plasma (CAP)/J-Plasma as compared with current-based electrosurgical unit.

**Fig. 4** There are different device configurations for the cold atmospheric plasma (CAP)/J-Plasma device but all are equipped with a retractable blade or needle for tissue interface.

**Fig. 5** and **Fig. 6** Graphical and histological comparisons of the thermal ablation zones of CAP/J-Plasma compared with standard current-based electrosurgical ablation zones.

**Fig. 7** A comparison of the ablation zones in peritoneum comparing CAP/J-Plasma with conventional electrosurgical devices.
**Fig. 5** Adjacent tissue thermal effects of various surgical devices. x-Axis mean width of thermal damage and y-axis mean depth of thermal damage.

**Fig. 6** A tissue sample of devices and adjacent thermal damage.
spread ranging between 1.0 and 4.0 mm total diameter with typical use.\textsuperscript{16}

**CAP/J-Plasma for Skin Tightening and Skin Rejuvenation**

Laser, RF, high-frequency focused ultrasound, and other thermal-induced contraction of collagen is well known in medicine and is used in ophthalmology, orthopaedic applications, and treatment of varicose veins. Each type of collagen has an optimal contraction temperature that does not cause thermal destruction of connective tissue but induces a restructuring effect in collagen fibers. The reported range of temperatures causing collagen shrinkage varies from 60 to 80°C.\textsuperscript{17} At this temperature, tissue contraction occurs immediately after tissue reaches the threshold temperature. The shrinkage of tissue is dramatic and can reach up to 30% of the heated tissue volume. This type of contraction is well studied in cornea, joints, cartilage, and vascular tissue, but its application for skin, subdermal tissue, and subcutaneous tissue tightening has been rarely studied.\textsuperscript{17} Noninvasive tissue tightening treatments have an inherent safety limitation because energy is delivered through the skin surface and the threshold epidermal burn temperature is significantly lower than the optimal temperature for the collagen contraction. Studies indicate that deeper penetrating energy provides better skin contraction and RF energy, by penetrating deeper than laser radiation, is a superior method, not only for treatment of facial rhytides and laxity, but also for body tightening. When considering skin contraction, we have to differentiate two-dimensional (2D) horizontal x-axis tightening of the skin surface from three-dimensional (3D) x-y-z tissue tightening of the subcutaneous tissue, where the skin is also more firmly connected and adjacent to the deeper anatomical structures. If 2D contraction is a function of collagen structure changes in the dermis, the 3D tissue-tightening changes involve contraction of different types of collagenous tissue. We can separate the following types of collagen tissue in the subcutaneous space: (1) Dermis: papillary and reticular; (2) Fascia: relatively thick layer of connective tissue located between muscles and skin; (3) Septal connective tissue: thin layers of connective tissue separating lobules of fat and connecting dermis with fascia; and (4) Reticular fibers: framework of single collagen fibers encasing fat cells.\textsuperscript{17} I agree with Kenkel\textsuperscript{18} that skin tightening and elasticity changes following thermal injury of soft tissues including fat and collagen are mostly a result of subdermal tissue contraction but not dermal contraction only, which experiences lower heating during the treatment. It is clear that 40 to 42°C applied to the skin surface cannot result in an immediate contraction effect. Deep dermal remodeling may account for some horizontal contraction over time. It is possible that the dermal–fat junction experiences higher temperatures, but this process requires future investigation. Most of the thinking on this is that the mechanism of subcutaneous collagen contraction during thermal stimulation of the interstitial space is similar to that witnessed in other types of collagen in that the contraction process has thermal contraction thresholds in the range of 60 to 70°C. It is likely more accurate to talk about tissue contraction rather than skin tightening because significant area contraction is a result of the strong contribution of deeper adipose fascial layers. Further studies with accurate 3D area measurements will tell us more about thermal-mediated technology. These thermal processes and contraction can be effectively applied during different microinvasive surgical procedures in improving patient satisfaction and extending procedures like facial and body contouring procedures to higher-weight patients and patients with compromised skin conditions.\textsuperscript{17}

Skin rejuvenation results with CAP/J-Plasma have been very impressive. The high temperatures applied at the epidermis and extending into the dermis and possible deeper penetration to the fibrous septal network (FSN) result in a level of rhytid correction that is seen only with the most ablative skin rejuvenation devices—full face ablative carbon dioxide and full-face phenol or trichloroacetic acid (TCA) face peelings. Although the results from this treatment can be dramatic, the prolonged recovery issues remain the same and that is the propensity for prolonged erythema. We are currently working on recovery protocols to lessen the erythema because the results for skin rejuvenation are unsurpassed.

**Case Study 1: CAP/J-Plasma Skin Tightening/Rejuvenation**

This patient presented for revision rhytidectomy after 15 years’ time. Evaluation of her aged thickened skin and mild jowl and
neck laxity influence the author to suggest CAP/J-Plasma skin rejuvenation only and no surgical intervention. The patient is shown before and 4 months after her procedure and demonstrates skin tightening and reduced skin thickness of the jowl, submental, and submental face and neck skin (Fig. 8).

**CAP/J-Plasma for Rhinophyma Treatment**

Rhinophyma is a skin disorder characterized by a large, red, bumpy, or bulbous nose. It can occur as part of phymatous rosacea. The exact cause of rhinophyma is unknown, but it is considered a subtype of severe rosacea. Overall, rosacea is a common, chronic inflammatory skin condition. While the ravages of subtype 3 (phymatous) rosacea have been well documented throughout history, today a multitude of options are available to restore a red, swollen, or bumpy nose (rhinophyma) to normal appearance. Although rosacea was not identified as a distinct medical disorder until the early 20th century, its existence has long been recorded in arts and literature, from the bumpy nose of the “Old Man and a Boy” by Ghirlandaio in 1490—a vivid representation of rhinophyma—to the red faces of subtype 1 rosacea depicted in “Dutch Merrymakers at Shrovetide,” by Frans Hals in 1617.

Early candid photographs show that the famed financier J.P. Morgan was afflicted with rhinophyma, including one in which he is brandishing an umbrella or walking stick to discourage the photographer, as his official picture was altered to correct the image of his nose, according to an article by Drs. Warren Dotz and Neil Berliner. Severe rhinophyma may be treated with surgical therapy, including lasers, cryosurgery, RF ablation, electrosurgery, a heated scalpel, electrocautery, and tangential excision, combined with scissor sculpting, skin grafting, or dermabrasion. Often a CO2 or erbium:YAG laser may be used as a bloodless scalpel to remove excess tissue and recontour the nose to a normal appearance, and fractional resurfacing may be of value in mild cases. To this list of treatment entities, we would add the CAP/J-Plasma ablation and this will most likely become the superior treatment modality for several reasons. Other treatment modalities have suggested high-frequency electrosurgery for shaving of subtype 3 (phymatous) rhinophyma. The dual cutting and vaporizing capabilities of the CAP/J-Plasma device make it ideal for treating severe rhinophyma. The retractable blade serves as a sculpting device and will operate with more thermal precision (less collateral thermal damage) in removing diseased tissue. After major debulking with the blade and blade is retracted and fine tuning of the rhinophyma is achieved with microplasma, the helium-based gas plasma surgical technology that powers J-Plasma takes much of the heat out of surgery. While J-Plasma turns down the heat, it ups the precision to micron level. It safely removes tissue cells layer by layer, allowing surgeons to ablate the affected tissue by “painting,” a technique that spares the healthy tissue that lies beneath. It is the author’s opinion that the CAP/J-Plasma device will become the treatment of choice for hypertrophic thickened subtype 3 (phymatous) rhinophyma. In addition to the precise shaving and vaporization capabilities, the device also exerts a high antibacterial effect and, as discussed previously, CAP appear to possess antineoplastic capabilities which sometimes accompany advanced rhinophyma. The antibacterial effects also will play a part for future development of device strategies to treat biofilms of all etiologies.

**Case Study 2: CAP/J-Plasma Treatment of Phymatous Rhinophyma**

This shows a patient with severe subtype 3 (phymatous) rhinophyma presented with nasal obstruction as well as cosmetic concerns about his enlarged nose. The patient underwent successful treatment with CAP/J-Plasma and is shown before and 10 weeks after treatment with CAP/J-Plasma (Fig. 9).

**CAP/J-Plasma for Minimally Invasive Jowl Submental and Neck Tightening**

Less invasive procedures for facial rejuvenation are becoming more popular as prospective patients seek out treatment options that offer the best possible results with the least...
amount of downtime. As the demand for “quick recovery” procedures increase and patients spend more time researching options, more informed choices are being made and many times patients opt for technologically advanced procedures. Such has been the case with the evolution of fiber laser, temperature-controlled RF, and ultrasound-based techniques in a genre of surgical techniques now termed “thermoplastic rejuvenation.” The procedures developed are now commonly termed “nonexcisional facial rejuvenation” and can be performed with many different types of technologies. Nonexcisional procedures aim to produce lipolysis and fat reduction in the areas affected, particularly the jowl and submentum, and also tighten collagen in the FSN and in the dermis. These associated changes create both facial contouring of the heavy face and neck but also provide skin tightening for additional benefit. The thermal precision found in CAP/J-Plasma has some advantages over laser or temperature-controlled RF. The device—tissue interface is selectively treated by the high energy microplasma but leaves the subdermal region and the nerve-bearing regions relatively unaffected. This lack of thermal penetration is encouraging with respect to patient safety and comfort but it may require more passes than other technologies due to limited thermal effects of the CAP/J-Plasma.

Case Study 3: CAP/J-Plasma Microinvasive and Nonexcisional Treatment of Lower Face and Neck
The patient is a 52-year-old interested in a nonexcisional procedure that would help with loose skin at the corners of the mouth as well as address jowl heaviness and submental fullness. She is treated with subcutaneous CAP/J-Plasma via submental incision and lobular puncture incision and is shown before and 3 months after her procedure. Additional tightening and definition should occur for up to 6 months and to a lesser extent of 1 year. Microliposuction is also done in conjunction with these procedures using a 2-mm cannula. Subplatysmal dissection was done with the device and limited platysmaplasty performed as well. A more defined mandibular contour is shown afterwards with slimming of the lower face and submentum. The mandibular cervical and submental angles are significantly improved (Fig. 10).

Case Study 4: CAP/J-Plasma Microinvasive and Nonexcisional Treatment of Neck
The patient is a 50-year-old who dislikes the loss of her cervicofacial contour with the accumulation of excess submental fat. She is treated with subcutaneous CAP/J-Plasma via submental incision and lobular puncture incision and is shown before and 3 months after her procedure. Additional tightening and definition should occur for up to 6 months and to a lesser extent of 1 year. Microliposuction is also done in conjunction with these procedures using a 2-mm cannula. Subplatysmal dissection was done with the device and limited platysmaplasty performed as well. As in case study 3, a more defined mandibular contour is shown afterwards with slimming of the lower face and submentum. The mandibular cervical and submental angles are significantly improved (Fig. 11).

CAP/J-Plasma Other Applications
CAP/J-Plasma has been used for rhytidectomy and is helpful in elevating flaps and especially in ligamentous release of the mandibular and zygomatic ligaments. The thermal dynamics of the technology permit precise elevation of flaps without potential added thermal damage of the dermal plexus of vessels above the subcutaneous plane or below where most nerves reside. The blade feature facilitates easy subcutaneous dissection not only in the face but also the neck.

We have also utilized CAP/J-Plasma for skin tightening after laser lipolysis and for improvement of cellulite.

Complications
Patients treated with CAP/J-Plasma usually will not incur more or different complications than listed as potential complications for the procedure being performed. In fact, compared with other energy-based devices used in the subcutaneous or interstitial space such as fiber lasers or RF devices whether temperature controlled or not, the complication profile is relatively less and this is due the volume of unionized helium gas under the flaps which serves as a

Fig. 10  The patient is a 52-year-old who dislikes the loss of contour in mandible and submentum. She is shown before (left) and 3 months after (right) nonexcisional facial and neck contouring utilizing cold atmospheric plasma (CAP/J)-Plasma. Improvement in jawline and submentum is evident. Treatment included the lower face.

Fig. 11  The patient is a 50-year-old who dislikes the loss of contour in mandible and submentum. She is shown before (left) and 3 months after (right) nonexcisional facial and neck contouring utilizing cold atmospheric plasma (CAP/J)-Plasma. Improvement in jawline and submentum is evident. The treatment in this patient did not include the lower face.
Summary and Conclusion

CAP/J-Plasma offers unique benefits compared with CO₂ laser and conventional electrosurgical devices including (1) enhanced clinical effects; (2) no complicated setup or safety procedures; (3) no credentialing/certification required; and (4) no additional insurance requirements, and is an advanced energy device combining the unique properties of cold helium plasma with RF energy. Helium plasma focuses RF energy for greater control of tissue effect, enabling a high level of precision and virtually eliminating unintended tissue trauma. CAP/J-Plasma key benefits include low risk of injury to surrounding tissue due to: (1) minimized lateral and depth of thermal spread; (2) plasma stream length controllable and precise at the micron level; (3) less smoke, odor, and eschar; (4) no conductive currents through the patients; and (5) effectiveness on many tissue types. CAP/J-Plasma’s retractable blade enables greater versatility and control of the energy, as well as enhanced visibility at the application site. The device features pistol-grip and pencil handpieces with single-button cutting, dissection, ablation, and coagulation. CAP/J-Plasma offers many advantages for facial plastic surgeons in performing surgeries such as rhinophyma reduction, skin tightening and rejuvenation, microinvasive and nonexcisional facial and neck rejuvenation, and may also be helpful in treating skin cancers. We are optimistic that these devices will provide technology that improves and enhances patient care into the future.

Conflict of Interest

Dr. Gentile reports other from Bovie Medical Corporation, from null, outside the submitted work.

References