Among the most common dermatological surgical procedures are acne surgery/comedo extraction (CPT code 10040) and milia extraction/destruction (CPT codes 17110/17111). Although these codes are commonly used, a comprehensive discussion of all aspects of acne surgery is lacking. To make a start at evaluating the place of these procedures in the dermatological armamentarium, this article will review data available on these procedures on the Internet and on PubMed.

Defining Comedones — the Targets of Acne Surgery

Acne surgery involves comedo extraction of:

• Open comedones — pores containing keratin plugs with black tops, “black heads”
• Closed comedones — pores containing keratin plugs with white tops that are often more firmly embedded than open comedones, “white heads.”

Open and closed comedones are not commonly inflamed, but they can be inflamed. Milia are small cysts whose diameter is no larger than the ostia of a pore and are likely best thought of as a variant on a continuum with closed comedones.

History and Types of Comedo Extractors

The primary instrument for acne surgery is the comedo extractor. Comedo extractors were first used in 1873. This device was first created by Dr. Henry Piffard and later was modified a number of times until it attained its current form. The most commonly used comedo extractor is the Schamberg expressor. Its ends are slightly curved with an elongated opening for passage of comedo contents with a ribbed, central portion to help ensure a secure grasp. The Unna expressor possesses ends that are slightly angled with oval cups close to the tips and an aperture smaller than the Schamberg expressor. Walton and Saalfeld expressors each have an oval cup-shaped aperture-punctured end on one side and a lancet (used to open closed comedones) on the other. The Zimmerman-Walton expressor modifies the Walton model with a cupped end and a tapered end that can contain a disposable 30-gauge needle. In surgical catalogs similar models are sold under the names of various dermatologists who fashioned particular models. (See Table 1) Prices for comedo extractors made for dermatologists range from $15 to $40.

Historically, various implements have been used as comedo/milia extractors including: paper clips, safety pins and syringes. The comedones of Favre–Racouchot disease (FRD), a common disease characterized by solar elastosis and large open comedones and cysts, can be extracted using standard dissecting forceps without complications or discomfort.

Payment for Acne Surgery

Some healthcare insurance companies including Medicare pay for acne surgery and related treatments that are “medically necessary.” One insurance company’s policy language relating to insurance company payment of acne surgery states that it pays for “any” of the following procedures as medically necessary for the treatment of active acne vulgaris:

• manual comedone extraction for non-inflammatory comedones.
• intralesional injections of corticosteroids (e.g., triamcinolone acetonide) for large nodules.
• incision and drainage or opening and removal of cysts or pustules.
• cryotherapy/cryosurgery (e.g., liquid nitrogen, acetone slush, carbon dioxide [CO₂]) for isolated inflammatory nodular lesions that fail to respond to topical and systemic medication therapy.
• light cautery/electrocauterization or CO₂ laser for multiple macrocomedones (e.g., microcystic acne, whiteheads greater than 1.5 mm in diameter) that fail to respond to topical and systemic medication therapy.

Technique of Acne Surgery

The Skin Therapy Letter dated August 1996 described the technique for performing acne surgery. “Open comedones (blackheads) are usually directly extracted with a comedo extractor, while closed comedones (whiteheads) must usually be
punctured with a sharp blade or point before the extraction is performed.

“It must be noted that comedo extraction can be uncomfortable and even painful and occasionally can lead to dyspigmentation and, even less commonly, to scarring.”

**Benefit/Cost Ratio of Acne Surgery — The Argument That the Costs Are Greater Than the Benefit**

Controversy exists as to whether the benefits of acne surgery outweigh its risks. Maddin in 1984 and 1996 questioned the utility of acne surgery. In his later 1996 article, he cited Jansen and Plewig’s histopathological data that conclude that acne surgery did not demonstrate that it greatly influenced acne’s course of the disease and sometimes resulted in scarring.1,7

In 1995, Jansen and Plewig reported a clinical and histopathological study. In the study, comedones were squeezed out with comedo extractors and immediately studied. They examined skin biopsies taken from the sites of acne surgery 2 to 20 minutes afterward, 1 hour later, and 1 to 105 days after such surgery had taken place. Jansen and Plewig stated that even when comedones were carefully extracted, common histopathological features of acne surgery sites included epithelial defects and inflammatory and granulomatous foreign-body reactions. Moreover, even when not visually evident, inflammatory reactions and/or scarring were always present at the acne surgery sites. In almost all cases, unless the epithelial capsule of the comedo was extracted during surgery, during the extraction, comedones started to return and became visible within 4 to 6 weeks. However, the comedonal epithelium was rarely totally expelled or the follicle and comedo permanently removed.

**Benefit/Cost Ratio of Acne Surgery — The Argument That the Benefits Are Greater with Surgery**

Most dermatologists I have spoken with have not encountered the scarring or permanent pigmented alteration after using acne surgery that Maddin, Jansen and Plewig discussed.

Comedo extraction done at weekly intervals leads to faster resolution of lesions, according one dermatologist:4 Jonathan Nevin Yu, in a digest of comments on guidelines for acne treatment assembled from the dermatology online forum Dermchat in December of 1996, discussed Maddin’s 1996 article and noted that:

“We have seen a lot of acne patients and performed thousands of comedo removals on each of them and found results superior as compared to just applying topicals. We have not seen a patient develop any scarring. We have been using the Robbins extractor 1.5 and 2.5. Marked improvement just after one visit [was noted] and our patients are very happy…. Comedo extraction with topicals, I believe, works hand in hand in treating acne.”

Also in Dermchat, dermatologist, Mark Naylor discussed Maddin’s 1996 article and noted:

“I have always been of the opposite opinion as far as open comedones (‘blackheads’) are concerned, e.g., physical extraction done properly is better than drug therapy (certainly faster). The opening of the comedo has to be large enough to easily deliver the plug; if you do it on small ones, you will see a lot of inflammation and probably won’t be able to get them out anyway. Drug therapy with retinoids is probably the treatment of choice for closed comedones due to acne. Milial cysts usually have to be removed surgically (even if it is just extraction with an 18-gauge needle for a scalpel and a comedo extractor).”

There also appears to be a role for ablation of closed comedones in acne surgery.19,20

**So, Does Acne Surgery Have a Role?**

The comments of Naylor and Yu are illustrative. While Maddin’s arguments are well reasoned, it is important to note that all acne treatments — with the exception of isotretinoin, which permanently shrinks the sebaceous gland by up to 90% — wear off in 4 to 6 weeks (and in fact, they often take 4 to 6 weeks to take effect).

In addition, oral and topical antibiotics and topical retinoids, as well as benzoyl

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**Table 1. Specific Eponymic Names of Comedo Extractors**

<table>
<thead>
<tr>
<th>Eponymic Type of Extractor</th>
<th>Description</th>
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<tbody>
<tr>
<td>Blau Comedo Extractor</td>
<td>Comedo extractor with lancet</td>
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<tr>
<td>Saalfeld Comedo Extractor — 4.25&quot;, with acne lancet, professional pattern</td>
<td>Comedo extractor with lancet</td>
</tr>
<tr>
<td>Saalfeld Comedo Extractor — 5.75&quot;, 14.6 cm, with acne lancet, professional pattern</td>
<td>Comedo extractor with lancet</td>
</tr>
<tr>
<td>Shalita Expressor — 1.5-mm head</td>
<td>Comedo extractor with cupped end</td>
</tr>
<tr>
<td>Shalita Expressor — 2.5-mm head</td>
<td>Comedo extractor with cupped end</td>
</tr>
<tr>
<td>Shalita Expressor — Double Ended, 1.5 mm/2.5 mm</td>
<td>Comedo extractor with two cupped ends</td>
</tr>
<tr>
<td>Shalita Expressor — 1.5 mm, with set screw for Hagedorn needles</td>
<td>Comedo extractor with cupped end and place for Hagedorn needles with a slotted cup</td>
</tr>
<tr>
<td>Shalita Expressor — 2.5 mm, with set screw for Hagedorn needles</td>
<td>Comedo extractor with cupped end and place for Hagedorn needles with a slotted cup</td>
</tr>
<tr>
<td>Walton Comedo Extractor — 6&quot;, spear point with cover</td>
<td>Comedo extractor with lancet</td>
</tr>
<tr>
<td>Orentreich Comedo Extractor — 6&quot;, round handle with needle holder</td>
<td>Comedo extractor with cupped end</td>
</tr>
<tr>
<td>Schamberg Comedo Extractors — 3.75&quot;</td>
<td>Small-, fine- or square-crippled loops at ends</td>
</tr>
<tr>
<td>Unna-Sobel Comedone Extractors — 1-mm and 1.5-mm aperatures</td>
<td>Comedo extractor with two cupped tapered ends</td>
</tr>
</tbody>
</table>
Does Acne Surgery Have a Role?

Acne treatments are already self-limiting by nature because the epidermis turns over every 3 to 4 weeks. In fact, the clinical course of the pore in Favre-Racouchot disease suggests that over time pores dilate by keratin plugs become dilated and patulous. So, by preventing the prolonged dilation of a pore, a transformation of a pore with a dilated ostia to a pore with a permanently dilated ostia can be prevented.

It would seem to me, based on my practice, discussion with dermatologists and review of the literature that judicious, focused acne surgery does have a role in the treatment of acne. Its effect is immediate and gratifying to patients and dermatologists, unlike medical treatments for acne. Acne surgery appears best integrated with topical treatments, in particular topical retinoids (which normalize follicular penetration and result in opening closed dilated ostia to a pore with a permanently dilated ostia can be prevented. So, by preventing the prolonged dilation of a pore, a transformation of a pore with a dilated ostia to a pore with a permanently dilated ostia can be prevented.

The histological effects that Plewig noted did not indicate that visible scarring occurred but that scarring occurred in the healing process on a microscopic level. While seemingly cosmetically and perhaps medically useful, the role of acne surgery needs to be more fully defined. As in so many areas of dermatology and medicine, a well-designed clinical study assessing microscopic, visible and patient satisfaction effects would be useful in fully assessing the role of acne surgery.

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References
