Office-Based Treatment: TCA and the IRC 2100™ Infrared Coagulator

Stephen E. Goldstone, MD, FACS
New York, NY

J. Michael Berry, MD
San Francisco, CA

The key to successful treatment of anal squamous intraepithelial lesions (ASIL) is identifying lesions: If you can identify lesions, you can treat the lesions. If high-grade squamous intraepithelial lesions (HSIL) or condylomata have been diagnosed, it is preferable to treat patients in the office whenever possible. There is no specific antiviral therapy for human papillomavirus (HPV) infection and no single optimum treatment for HPV-related lesions. Therapy is directed at ablating the lesions caused by the virus (condylomata, LSIL, HSIL, and invasive cancer). The choice of treatment is determined mainly by the location, either intraanal or perianal, and by the volume and extent of disease. If a biopsy shows HSIL and there is no clinical suspicion of invasive cancer, then ablation by any technique is acceptable. If there is any clinical suspicion of cancer, then larger biopsies must be performed, usually in the operating room (OR). Other factors that influence the decision to treat include the patient's overall health and immune function and the patient's preference and tolerance for office-based therapy. Except for patients who are highly anxious, needle phobic, or emotionally traumatized as a result of abuse, most patients are amenable to and prefer office-based treatment. Even patients who are anxious can often be given mild oral antianxiety medication and undergo successful in-office ablation.

Although some clinicians do, it is not our practice to generally treat flat LSIL. HSIL is treated after biopsy confirmation of pathology, and then the patient is brought back for subsequent treatment. Even if a patient has visible warts, we prefer to perform high-resolution anoscopy to rule out associated HSIL and then schedule the patient for definitive therapy of both condylomata and HSIL at one time. It helps to photograph lesions at the time of biopsy to help in reidentifying them for ablation at a subsequent visit. If you do not have photographic capability, then describe the lesion as best you can in your office record. We prefer to divide the anus into octants (anterior, posterior, left lateral, right lateral, left and right posterior, and left and right anterior) rather than using the clock face method, to prevent confusion over where 12 o'clock is. It is also important to remember that the mucosa is much more fluid in the anus than in the cervix and a lesion can shift, depending on how the anoscope is positioned. Thus, what appeared to be a posterior lesion at biopsy can shift with the mucosa to as far as right lateral when the anoscope is inserted for treatment.

Small, thin, intraanal lesions, either HSIL or condylomata, can be treated with repeated applications of 85% tricholoroacetic acid (TCA). As a rule of thumb, we classify a lesion as small if it occupies less than an eighth of the anal circumference as seen through a standard plastic anoscope or less than 1 cm in overall diameter. Clearly, this size assignment is very subjective, but in our clinical experience larger lesions often do not respond to TCA and recur quickly. It is recommended that applications be done every 2–3 weeks for up to 4 treatments. A small amount of TCA is placed in a cup and the wooden end of a cotton-tipped swab is used to wick up the TCA, the excess is shaken off, and then the TCA is directly applied to the lesion until it turns white. Patients experience usually mild discomfort for a few days that rarely requires pain medication. A superficial ulceration occurs that reepithlializes. Patients are reevaluated several months after the last treatment to determine adequate response. If HSIL is found on repeat biopsy or if warts have not resolved, treatment with other methods such as infrared coagulation is an option.

Small perianal or intraanal lesions that are discrete can often be treated with cryotherapy, with or without application of TCA. We often freeze first with liquid nitrogen (utilizing a spray canister or direct application with an applicator swab) and then apply TCA unless the lesion is very small or superficial. These lesions can often be treated with either cryotherapy or TCA alone. If a lesions is verrucous and bulky we often freeze the lesion thoroughly with liquid nitrogen and, working very quickly, cut away still frozen tissue. We then refreeze the base of the lesion. Bleeding can occur when the base thaws, but this bleeding can be controlled with pressure or a coagulant such as Monsel's solution. Cutting away

frozen tissue can be done without anesthetic and greatly reduces the number of treatments a patient with bulky lesions requires. Clearly, the operator must work quickly to cut away the tissue while it remains frozen and numb. The advantage of cryotherapy is that it does not require anesthesia and can be delivered through a special canister and nozzle or with an applicator. The disadvantages are that it often fogs the anoscope, making it difficult to see, and you cannot gauge depth of destruction, so that repeated evaluations are often necessary to ensure that the entire lesion has been destroyed.

Larger or multiple perianal condylomata can be often managed with Aldara (5% imiquimod cream), particularly in immunocompetent patients. Patients who are HIV-positive with low CD4+ lymphocyte counts (<200 cells/mm^3) may not respond. Aldara is often used for patients with larger perianal lesions, including HSIL, and some patients may respond.[1] If HSIL has been diagnosed, patients should have regression documented by biopsy and should be followed regularly and carefully for recurrence. If patients do not have any significant response by the end of 4 months, they are probably unlikely to respond. In fact, if I don't see perianal irritation with persistence of lesions, I often terminate imiquimod therapy after 6–8 weeks and choose an alternative treatment. Some patients will have a decrease in the amount of perianal ASIL, which can then make surgical treatment easier and require less tissue to be burned. The important message is that patients must be assessed for response. In our clinical experience, Aldara is often not effective for perianal HSIL. Reports from Europe seem to indicate a better response than we have observed, and although we do not recommend that it be used intraanally, there have been reports from Austria and Germany of intraanal Aldara tampons used with some success.[2] We also use imiquimod in some patients who have undergone successful ablation of extensive disease after treatment to try and decrease recurrence. We usually prescribe a 4-month course of therapy.

Many surgeons have electrocautery available in their offices, and this can be easily adapted for ablation of condylomata and HSIL. Anesthesia is always required, and long tips are necessary for working down the barrel of the anoscope. The disadvantage of using electrocautery is the smoke plume it produces, which requires a smoke evacuator. If the smoke is not evacuated the anoscope quickly becomes clouded, making working through it impossible. Moreover, there are implications that viral particles can be present in the smoke. Tissue destruction is much greater with electrocautery than with other methods, and, while it allows for complete destruction of a lesion at a single examination, it also has the potential to burn into a hemorrhoid or underlying sphincter if the surgeon is not careful. We prefer electrocautery with the needle tip for precise ablation of small external lesions. Even with electrocautery, recurrence rates are high and patients should be reevaluated 3 months after therapy to ensure proper ablation.

We must also not forget the value of surgical excision of a lesion. Often HPV-related disease, such as a pedunculated condyloma, can be excised after anesthetizing the base. Moreover, small intraanal HSIL can be excised easily with 1–2 bites with the biopsy forceps. Patients must be followed for recurrence.

One of the most exciting innovations in the treatment of anal HSIL and condylomata has been the development of infrared coagulation using the IRC 2100™ infared coagulator (Redfield Corp, Rochelle Park, NJ), a technique pioneered by Stephen Goldstone.[3] The IRC uses a far-infrared light delivered from the source through a shielded, polished, quartz light guide covered with a disposable plastic sheath. The pulse of light is typically set at 1.5 seconds, which causes coagulation to a depth of approximately 1.5 mm. The IRC has been used successfully to treat many different types of lesions in the anal canal, including hemorrhoids and condylomata.

We employ the IRC to treat both internal condylomata and HSIL in a single examination. As mentioned earlier, a decision to treat is based on biopsy confirmation of HSIL that was obtained at a prior HRA. We then schedule the patient for an ablation once the presence of disease is confirmed. Patients do not have to cleanse their bowels before treatment (enemas often are not fully evacuated, making treatment more difficult). Occasionally we find too much stool in the rectal vault and ask the patient to try and move his or her bowels, and this often suffices. If the patient requires antibiotic prophylaxis to prevent endocarditis, we request that the patient premedicate in accordance with his or her physician's recommendations.

We visualize the lesion with HRA and then anesthetize the area with lidocaine with epinephrine. Although many lesions are above the dentate line, the heat from the IRC will diffuse distally, producing pain at the end of the light pulse. We inject minimal amounts of anesthetic agent—often no more than 1 mL for 2–3 lesions—because more anesthetic generally distorts the architecture, making the procedure more difficult. A small amount of anesthetic agent is injected through the barrel of the anoscope utilizing a 1-mL syringe with a 30-gauge, 1-inch needle directly into the lesion, or alternatively, a 25-gauge spinal needle attached to a 10-mL control syringe can be used, allowing the operator to work through the anoscope. After waiting 30 seconds we can inject more distally without the patient feeling any discomfort. The bulk of the anesthetic agent is given distally to anesthetize the pain sensory neurons.

The lesion is treated by touching the IRC to it and firing for 1.5 seconds. The tissue blanches, and we reposition the IRC and fire until the entire lesion has

been completely ablated. The char that forms can be debrided by moving the anoscope in and out. We then re-treat the base with the IRC. We sharply debride the char with baby Tischler biopsy forceps to a depth of the submucosal vessels, which can be seen bulging into the wound. These vessels are coagulated with the IRC prior to terminating the procedure. Any bleeding can also be coagulated with the IRC.

The IRC also works very well on bulky condylomata. It can be used to ablate an entire thick lesion in a process of coagulating, excising necrotic tissue, and recoagulating in serial fashion until the lesion has been removed to the submucosal vessels. At first we treated only isolated and often small lesions, preferring to take more advanced disease to the OR. With experience we have safely treated larger and more extensive lesions. If there is any suspicion that a cancer might be present, adequate biopsy specimens must be taken prior to ablation to ensure that this is not the case. Once ablation has occurred, no suitable tissue for histology remains, and a patient with invasive cancer might be inadequately treated.

Post procedure we tell patients that they can expect 1–2 weeks of pain and bleeding with bowel movements. In over 1,000 treated patients we have only had 1 incident of postprocedural bleeding 1 week later, which was successfully coagulated with cautery in the office. Patients are given mild narcotic medication for analgesia, but most do not use it. We ask that they refrain from anal sex until all bleeding and pain subsides. No patient who wanted to have anal sex was prevented from doing so post procedure. We have also not had any incidence of anal stricture.

We recently published a retrospective analysis of our results with IRC ablation of HSIL in 68 HIV-positive men who had sex with men (MSM). Median patient age was 41 and follow-up was as long as 3 years but not less than 6 months. An average of 1.03 lesions were treated at each visit (range, 1–5 lesions). Patients had a recurrence if the treated lesion persisted or if a new lesion developed (metachronous lesion). We found that of the 68 patients treated the first time, 65% developed another lesion requiring treatment. The other 35% of patients did not develop another HSIL for a median of 413 days. We also found that the more we re-treated patients the less likely they were to develop a new lesion. When we looked at the cure rate for individual lesions we found it to be 72%. When persistent lesions were re-treated a second time, the cure rate was again 72%. Our data also showed that as we gained more experience with the procedure, our results improved. We also discovered that the more lesions we treated, the more likely the patient was to develop a recurrence.

Given the high recurrence rates, these results might seem discouraging. It is important to note, however, that they compare favorably with those reported by Chang et al in their operative experience.[4] Moreover, the gynecology literature reports recurrence rates of 62%–73% for high-grade cervical dysplasia in HIV-positive women when the entire transition zone is removed.[5,6] The anus is not amenable to resection of the transition zone, so one would expect higher recurrence rates in the anus than cervix, but we did not find this to be the case. When cervical lesions are ablated locally the recurrence rates are 83%–100%, much higher than what we found in the anus.[5]

We have found the IRC to be an excellent tool for ablation of HSIL and other HPV-related anal disease. It is a relatively inexpensive, low-maintenance machine that affords excellent in-office destruction of lesions without significant pain or morbidity. No smoke plume is produced, so smoke evacuation is not an issue, and it is hemostatic. Follow-up is necessary as recurrence rates are high. Although we follow patients every 3–6 months with digital rectal examination, cytology, and anoscopy, we have tried not to treat patients more than once or twice a year, as we fear more frequent ablations would become overly burdensome to their lifestyle. Moreover, we feel that with close monitoring, the risk of transformation of a missed lesion to invasive cancer is unlikely in the short time span of 6 months. Clearly, if a lesion is visible with standard anoscopy, suspicious, or extensive, we treat it immediately.

Some clinicians use the IRC for external lesions as well. In our practice we prefer to use electrocautery if the external lesions are small because often the IRC tip is larger than the external lesion. There is also a shorter and smaller 3 × 90-mm light guide as opposed to the 6 × 210-mm regular light guide, which we have found to be useful for small lesions.

A basic tenet of surgery is that the surgeon should employ the technique he or she feels most comfortable with. We have presented multiple modalities for treating perianal and intraanal HPV, and we leave it to you to determine which method proves optimal in your hands. Remember, you are dealing with mucosal lesions, so the depth of destruction does not have to be great, but you must thoroughly destroy the lesion to reduce recurrence. Moreover, the treatment must not cause morbidity that is not commensurate with the relatively low risk that a lesion will transform into invasive cancer. Don't become frustrated by high recurrence rates, and remember that there is a learning curve. With experience your results will no doubt improve. And last but not least: If you can identify a lesion you can treat it.