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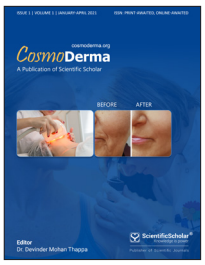

Focus

Surgical removal of moles

Rashi Pangti[1], Somesh Gupta[1]

[1]Department of Dermatology and Venereology, All India Institute of Medical Sciences, New Delhi, India.

***Corresponding author:**
Dr. Somesh Gupta,
Professor, Department of Dermatology and Venereology, All India Institute of Medical Sciences, New Delhi, India.

someshgupta@hotmail.com

Received : 06 July 2021
Accepted : 07 July 2021
Published : 19 July 2021

DOI
10.25259/CSDM_32_2021

Quick Response Code:

Melanocytic nevi are the common benign proliferation of melanocytes. These can be congenital or acquired. Acquired melanocytic nevi, also known as moles, appear from childhood to usually midlife, are present in all races, and are more in number in the white population.

Moles can be classified based on the depth at which the melanocytic nevus cells or nevomelanocytes are present. Single nevus cells in the basal layer with nests of nevus cells are present in the tips of rete ridges or between them, in the case of junctional nevus. In addition to the junctional component, compound nevus has nevomelanocytes in the dermis, arranged as nests, cords, or single units. Intradermal nevus has only the dermal component of the compound nevus. As melanocytes move from the epidermis to the dermis, they gradually lose their ability to produce pigment. Junctional nevus presents as a flat, pigmented brown macule while a compound nevus is a slightly raised, brown papule with the color of the brown ranging from light to dark according to the individual's skin color. Intradermal nevi present as skin-colored, dome-shaped papule or nodule with hair projecting from the surface at times.[1]

The diagnosis of moles is usually made on clinical morphology. In instances, when doubt arises regarding the diagnosis, dermoscopy, and reflectance confocal microscopy are of added value in the diagnosis as they are non-invasive modalities. However, histopathology remains the gold standard for confirmation. All excised specimens should be sent for histopathology as a rule of thumb.

These moles, in common layman language, referred to as beauty spots or marks; however, when large or located on cosmetically sensitive sites, such as on nose, may cause cosmetic concern to patients.

Some other skin lesions sometimes may mimic melanocytic nevi. These include dysplastic nevi, pigmented basal cell carcinoma, seborrheic keratosis, and melanoma. In this review, we shall focus on the surgical removal of moles by various surgical methods, the reason of which is mostly cosmetic in nature or at times repeated trauma to them. Thus, its removal comes with the given proposition of cosmetic excellence.

SHAVE EXCISION

It is commonly used for the removal of small junctional or compound nevi. The steps of shave excision are as follows.

After the cleaning and draping of the mole to be removed, first, the skin around the mole is stretched between the forefinger and the middle finger in a direction perpendicular to the relaxed skin tension lines (RSTLs). Infiltrative local anesthesia is given into and around the lesion. This gives a slight elevation to the lesion, which facilitates the procedure of shave excision. Now, a surgical blade numbered 11 or 15 attached to the Bard-Parker scalpel number 3, held parallel to the surface of the skin, in a horizontal motion is swept across through the part of the mole projecting above the surrounding skin surface.[2] Instead of a surgical blade, an ordinary razor blade broke in half after sterilization can also be used.[3] Homeostasis is achieved by pressure or electrocautery.

The advantages of this procedure are that it is a simple procedure with minimal skill required, quick to perform, does not require suturing, and healing is faster. The disadvantages are that its use is limited to smaller, elevated moles, high chances of recurrence as the removal by this method is superficial and the inadequate sample for histopathology as the sample obtained is only of the upper layers of skin.

In a study of moles treated with shave excision and electrocautery for homeostasis, at the end of 6–8 months, 46% of head-and-neck nevi had no visible scar and the remainder had a cosmetically acceptable scar. Regrowth of hair was seen in 24% of hairy nevi.[4] Recurrence was reported by Ferrandiz *et al.* in 19.6% of total 204 cases at 3 months after shave excision.[5] Lee *et al.* looked at the effectiveness of secondary intention after shave excision of benign tumors on lid margins and found it to be safe and effective. Through healing by secondary intention, a decrease of around 50% is seen in the size of the defect.[6]

COLD KNIFE EXCISION AND CLOSURE

This method of surgical removal can also be used for all types of moles.

The RSTLs are noted and an elliptical incision is given with longitudinal axis along the RSTLs. A single bold incision with precision is given using the surgical blade number 15 mounted on a Bard-Parker handle.[2] The excised part is cut using scissors ensuring to include a depth till deep dermis to reduce the chances of recurrences. Adequate undermining is done; if the excision was done over a bony area or over areas where the skin is stretched, more undermining is required so that there is no tension between the sutured margins. The open ends are sutured in two layers using buried subcutaneous sutures and simple interrupted skin sutures [Figures 1-3].

In the hands of an experienced dermatosurgeon, cold knife excision brings the best esthetic results. Furthermore, a significant advantage is that a completely excised lesion can be sent for histopathology. If suspicion of any dysplasia, an incision with full depth of the dermis and 2 mm margins is desirable.[7]

In a trial comparing the sutured elliptical excision with shave excision of intradermal moles, it was seen that the average scar size at 6 months after shave excision was much lesser than after elliptical excision ($P < 0.05$). However, 28.6% of patients who had undergone shave excision had recurrence vis-à-vis none of the patients in the elliptical excision group. The patient satisfaction score, as well as the evaluation score by the physician, was comparable in both groups.[8]

Figure 1: (a) A compound melanocytic nevus just above the upper lip, at baseline. (b) Good results at 6 months after serial excision (two sessions of surgical excision and closure).

Figure 2: (a) A congenital melanocytic nevus at a cosmetically important site (the tip of the nose), at baseline. (b) Three months after serial excision (two sessions of surgical excision and closure) has resulted in a cosmetically acceptable scar.

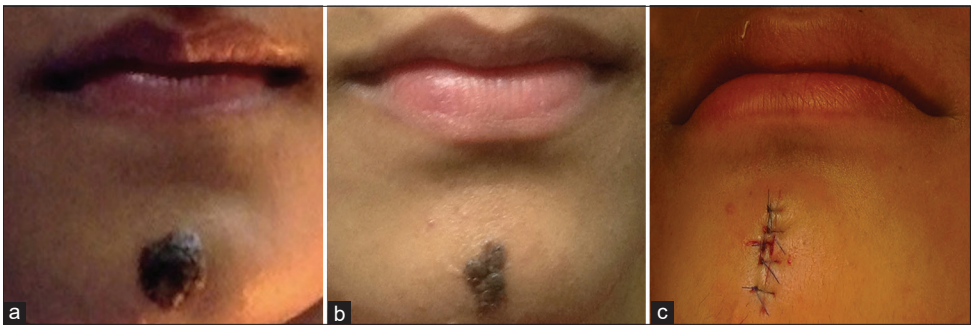

Figure 3: (a) A compound melanocytic nevus on the chin, at baseline. (b) Two months after undergoing first surgical excision of a part of melanocytic nevus. (c) Right after the second session of surgical excision of the rest of the melanocytic nevus (serial excision).

SERIAL EXCISION

For bigger moles, serial excision at conveniently spaced-out time intervals is the best approach. This brings about reducing the size of the mole at each procedure while not compromising on the esthetics as every time the incision includes the scarred tissue or the suture line from the previous procedure(s). Serial excision is a kind of tissue expansion. Once we excise a small area, the tissue is expanded because of its elasticity. This allows us to carry out the second procedure with much ease and close without tension [Figures 1-3].[9] Another advantage is serial excision of the mole reduces the loss of normal tissue. We can, also, remove a round lesion by serially excising it without "dog ear" formation. To avoid "dog ear" formation, the ratio of length and breadth of the incision is kept as 3:1.

PUNCH EXCISION AND CLOSURE, AND PUNCH EXCISION AND PUNCH GRAFTING

Punch excision is ideal for small moles, usually <5 mm in diameter. A biopsy punch is chosen according to the diameter of the mole.

After putting the punch around the mole, the punch is held vertically and rotated gradually in a clockwise direction while traction is given in a direction perpendicular to the long axis of the RSTLs. The excised part is held with forceps and the base cut with scissors. An interrupted suture or two is put in place using non-absorbable suture material.[2] Alternatively, the wound can be allowed to heal with secondary intention.

The pros of using this method are that it is quick and easy to perform, not requiring much technique. The cons are residual nevus and that closing a round defect after punch excision can cause "dog ears" formation.

Residual nevi were found in 24.9% of reexcision which were initially shave or punch excised in a study by Cohen *et al*. These residual nevi were more often seen after punch excisions than with shave excisions.[10] In cases of compound nevi, there is usually a tapering junctional component with the central dermal component. Punch excisions take care of the central dermal part which is removed but the surrounding tapering part of the nevus (junctional component) is left behind.[11]

To evade the "dog ears" formation after suturing punch excisions, Gupta *et al*. proposed the defect after punch excision to be filled with a punch graft taken from the posterior auricular area of the patient. The authors reported superior results with this method.[12]

RADIOFREQUENCY (RF) EXCISION

This method of surgical removal can be used for all types of moles. The initial steps of preparation of the part and infiltrative anesthesia are the same as for shave excision. For smaller and flat moles, surface RF ablation can be done in which the tip of the RF probe (monopolar in cutting mode) is touched on the surface of the mole. The power setting of RF is kept at a lower value to minimize the collateral heating and charring of skin.[13] Subsequently, surface RF ablation can be done till the dermis.

For elevated and/or bigger moles, an elliptical incision is made around the whole mole, perpendicular to the RSTLs, using the flat RF monopolar probe in cutting mode. The mole is removed using scissors and undermining is done to ensure tension-free apposition of the two ends. The defect is then closed in two layers, using absorbable sutures for the inner layer and non-absorbable sutures for closing the skin. Alternatively, the mole removed using an RF probe from its base and the wound is allowed to heal with secondary intention. The sample can still be sent for histopathology.

The upside to this procedure is the easy homeostasis using the RF probe with the swift switch to the coagulation mode in the RF machine. The downside is that cosmetic results may not be great with RF due to the transfer of energy to also the surrounding area.[13]

LASERS

Both ablative- and pigment-specific lasers or their combination can be used for removal of acquired melanocytic nevi. Er: YAG and CO2 (ablative) lasers have

been used with good efficacy in treating moles. Short-pulsed Er: YAG laser has shown promising results in flat and slightly raised moles.[10,13,14] Among pigment-specific lasers, studies using Q-switched alexandrite (755 nm), ruby (694 nm), and Nd: YAG (1064 nm) lasers have shown good results.[11,15,16] Multiple sessions are required, moles do not get removed completely, and recurrences after treatment are commonly seen. Flat junctional moles show better response than elevated compound nevi as the junctional part gets removed completely with lasers but the intradermal part either gets partially treated or recurs. The disadvantage is that the tissue sample is not available for histological confirmation.

CONCLUSION

There is a dearth of scientific literature on the treatment options for moles and their comparison as to which treatment modality is better than the other. Moles can be easily removed by any of the aforementioned methods. However, it comes with a caveat of recurrence after their removal. The choice of the method of removal of moles is at the discretion of the clinician in terms of availability of the set-up for a particular option, the skill required for the method, the size, shape, and location of the mole, suspicion of malignancy, as well as on informed choice of the patient.

In case of slightest doubt regarding the diagnosis, it is of paramount importance that we send the excised part for histopathology as moles can resemble few pre-malignant and malignant lesions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Pangti R, Gupta S. Surgical removal of moles. CosmoDerma 2021;1:27.