



Punch Incision with Secondary Healing (PISH) Technique for Benign Facial Lesions: An Institutional Experience in 307 Patients

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Indian J Plast Surg 2021;54:138–143.

Abstract

Background Multiple or solitary facial lesions pose a unique challenge to the attending surgeon in terms of delivering the best cosmetic outcome. There are various methods in dealing with them and the preference of using them is based on the surgeon's experience, patient expectations, and availability of instruments. One such tool, skin-punch, primarily designed for a biopsy can play a very important therapeutic role in this era of keyhole surgery. In this paper, we assess the technique of punch incision with its combination of secondary healing for various facial lesion.

Methods This observational study, a total of 307 patients with solitary or multiple benign facial lesions were treated with punch incision technique using 2 to 6 mm sterile, disposable skin biopsy punches. Subsequently, the wounds were managed with healing with secondary intention.

Results In our series all superficial wounds epithelized by 7 to 14 days while the deeper lesions epithelized by 14 to 28 days. We had three recurrences which were managed by fusiform excision and one patient had surgical site infection which was managed conservatively. On application of our self-devised facial scar scoring system (SCAR or Scar Cosmesis Assessment and Rating)³ on all the scars, the mean score was 6 at 1 year followup.

Conclusion Punch incision with healing by secondary intention is a relatively easy, effective, single-stage office procedure. This method can be considered as an alternative method for the removal of various skin lesions, especially on face, thus providing a simple solution to complex problems.

Keywords

- ▶ punch incision
- ▶ healing by secondary intention
- ▶ facial lesions
- ▶ skin biopsy punch
- ▶ PISH
- ▶ SCAR

published online
June 22, 2021

DOI <https://doi.org/10.1055/s-0041-1731257>
ISSN 0970-0358

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Introduction

“Scar” psychologically implies a horrid, distorting and devastating mark to most individuals.^{1,2}

Smallest of small lesions can create an enormous physical and psychological impact on one’s life, hence it is very important to treat them with techniques (surgical and nonsurgical) which give an acceptable scar to the patient.^{1,3} Traditional surgical removal of small lesions requires larger elliptical incision. In this paper, we discuss the novel use of skin punch incision technique with healing by secondary intention (PISH).

Materials and Methods

Materials

In total, 307 patients were operated by punch incision with secondary healing (PISH) technique between August 2015 and August 2019 by the same operating surgeon. The details of the nature of the procedure along with its pros and cons (including complications) were explained to the patients and written informed consent was taken.

The inclusion and exclusion criteria are mentioned in (► **Table 1**). Out of 307 patients operated, 138 were males and 169 were females. A total of 133 patients had some form of medical comorbidities which were controlled preoperatively (► **Table 2**). Perioperatively the following characteristics were assessed:

1. Location (aesthetic unit)
2. Type of lesion
3. Size of lesion
4. Wound size
5. Surface contour
6. Wound depth (underlying tissues exposed)
7. Scar/healing tendencies.

Operative Methods

Following adequate skin preparation, a field block was given by a 30-gauge needle around and at the base of the lesion with 2% lignocaine and epinephrine (1:200000). A sterile,

Table 1 Patient criteria

Inclusion criteria:
1. Solitary or multiple cystic lesion (infected/noninfected) on face of any diameter.
2. Solitary or multiple noncystic benign facial lesions up to 6 mm in diameter.
Exclusion criteria:
1. Keloidal tendencies
2. Hypertrophic scarring.
3. Ruptured cyst/lesions.
4. Malignant lesions.
5. Recurrent lesions.

Table 2 Patient characteristics

No. of patients	307
No. of lesions	342
Age (years)	
9–30 y	107
31–50 y	116
51–80 y	84
Comorbidities (HT,DM,HT + DM)	33HT, 36DM, 64HT + DM
Fitzpatrick skin type	
Type 4	103
Type 5	204
Wound surface	
Flat	70
Convex	108
Concave	164
Wound depth	
Superficial	324
Deep	18

Note: DM, diabetes mellitus; HT, hypertension.

disposable skin biopsy punch of varying diameter (2–6 mm) was used to create a small circular incision (► **Table 3**).

For small nerve sheath tumors and lipomas, an appropriate-sized punch was used to create a circular incision in the center. Following a thorough perilesional dissection with Westcott scissors, the swellings were excised in toto or in piecemeal fashion (► **Fig. 1**). After stretching the skin for cystic lesions (sebaceous cyst), an incision with punch at the punctum was made through which the contents of the cyst were extruded and the capsule was completely excised with the help of Westcott scissors. The cavity was then inspected with the help of two skin hooks and a curette was used to remove the remnants if any (► **Figs. 2 and 3**). For nevus, an appropriate-sized punch was used to create a circular incision followed by complete excision with 11 number blade (► **Fig. 4**). Pyogenic granulomas being vascular lesions were shrunk with 2% timolol maleate eyedrops (one drop twice daily for 3 weeks) and then an appropriate-sized punch was used to create a circular incision followed by complete excision of the lesion with 11 number blade followed by cauterization of the base (► **Fig. 5**). Hemostasis was achieved by adequate measures (manual pressure/cautery). Small circular adhesive-dressing was applied onto the wound cavity after application of antibiotic ointment. All specimens were sent for histopathological evaluation. Post-procedure a 9-point instructions list was explained and handed out to the patients (► **Table 4**).

A weekly follow-up done till wound healed and then follow-up at 6 weeks/3 months/6 months and then yearly follow-up was performed. During 1-year follow-up, the patient and nonoperating surgeons in the team assessed the



Fig. 1 Nerve sheath tumor, its preoperative location on the lip unit, note the *preexpanded* skin due to the lesion *per se* (A). Intraoperative views, (B–D), showing dissection around the lesions with its complete *in toto* extraction via a 3-mm skin punch incision. Postoperative views at 7th day with virtually invisible scar by 12 months, (E,F).



Fig. 2 Figure demonstrating detailed surgical steps while excision of a large sebaceous cyst over right temple region. (A) Preoperative profile view showing the site and size of the lesion. (B–D) Intraoperative views showing application of 4 mm punch with extrusion of sebaceous material and complete removal of cyst wall. Also note application of two skin hooks for the assessment of cavity and removal of the remnant with curette if present (E, F).

Table 3 Lesion types, lesion size, punch used, number of lesions managed, and follow up

LESIONS TYPE	LESION SIZE	PUNCH USED	NO OF LESIONS	FOLLOW UP (IN MONTHS)
SEBACEOUS CYSTS (n = 199)				
NON-INFECTED	<2.5 cms	3 mm	96	12–60
	>2.5 cms	3 to 4 mm	85	24–48
INFECTED	>2.5 cms	4 to 5 mm	12	24–48
	<2.5 cms	3 to 4mm	6	36–48
NEVUS (n = 108)	<3 mm	2 to 3 mm	44	36–60
	3–5 mm	3 to 5 mm	64	12–48
PYOGENIC GRANULOMAS (n = 11)	4 mm	4 mm	8	36–60
	5 mm	5 mm	3	24–36
LIPOMAS (n = 16)	<2 cm	3 mm	12	36–48
	>2 cm	4 mm	4	24–48
Dermoids (n = 4)	<2 cm	3 mm	1	36
	3 cm	4 mm	3	24–48
NERVE SHEATH TUMOUR (n = 4)	1–2 cm	3 mm	4	48–60

Table 4 Post-procedure a 9-point instructions

1. If the wound bleeds press firmly and report/contact us.
2. After surgery maintain dressing for 48 h, till then cleanse face with wipes.
3. Remove dressing after 48 h and wash with copious amount of water and cleanse the face with regular nonirritant face wash/ soap and pat dry with a clean linen/towel.
4. Apply antibiotic ointment with a small circular adhesive dressing till the wounds heals.
5. Not to manipulate the wound.
6. Report at earliest if any pus discharge, excessive bleeding, foul smell from the wound, severe pain, or excessive redness around the wound.
7. Continue sunscreen and face moisturizer around the dressing and over the scar once the wound heals.
8. Do not use face scrub for next 12 wk.
9. As wound heals a nodular swelling may be felt below the healed area, do not worry. It is a part of normal wound healing.

scars of the patients on a facial scar scoring scale devised by us with an acronym (SCAR or Scar Cosmesis Assessment and Rating)³ (►Table 5). Each letter had three subunits under it with a set of scoring systems based on our experience. The total score of the scale by adding 12 items ranged from 0 to 25, 0 being the lowest reflecting near normal skin and 25 the highest possible reflecting the worst possible outcome. This scar grading system was evaluated by the patient and nonoperating surgeons in the team.

Results

We treated 307 patients with 342 facial lesions (solitary or multiple) on OPD basis with PISH technique. Distribution of lesions over facial units include: nose (76), cheek (64), eyelids (57), chin (46), forehead (44), lips (32) and pinna (23). They are under follow-up till date. The overall mean operative time for surgery was 8 minutes (5–21 minutes). For cystic lesions



Fig. 3 Sebaceous cyst on face. Preoperative, postoperative, and follow-up views of noninfected sebaceous cyst on forehead (A), on right temple region (B), and cheek while (C, D) showing infected cyst treated with PISH technique. Note the site and size of the lesion with the final resultant scar.

(sebaceous cyst, 97 patients) greater than 2.5 cm, it took on an average of 18 minutes (14–21 minutes) for complete procedure. We managed 18 infected cystic swellings with PISH technique. Once treated, all of them resumed their routine activity after 1 to 2 hours. In our series no untoward adverse



Fig. 4 Preoperative, postoperative and follow-up views of nevus on face. Note the barely visible scar on follow-up.



Fig. 5 Pyogenic granuloma on face. Note the preop and postop wound size at day 7 and a near normal color match with scar easily blending with surrounding irregularities by 1 year.

effects like bleeding, hematoma, hypertrophic granulation tissue was seen. One patient of noninfected sebaceous cyst developed localized wound infection, which was managed conservatively without any further surgical intervention. One patient developed hypertrophic scar (forehead region with 4 mm punch) which was managed with intralesional steroids and silicone gel sheet application. All superficial wounds involving skin and subcutaneous tissue were epithelized by 7 to 14 days, while deeper lesions healed by 14 to 28 days. Initially, during the proliferative phase (within 2 weeks) all patients noticed a firm nodular swelling under the punch incision site which subsided without any intervention by 4 to 6 weeks.

We had three recurrences (two infected sebaceous cysts and one dermoid.). The sebaceous cysts recurred at the end of 6 months, while dermoid recurred by 12 months which were managed with traditional elliptical incision along relaxed skin-tension lines (RSTLs). In 279 patients post inflammatory

Table 5 (SCAR)³ Facial scar scoring scale 0 to 25

S ³	Satisfaction overall	Impressed 0	Happy 1	Neutral 2	Unhappy 3	Ugly 4
	Suppleness	Same of adjacent 0	Soft 1	Firm 2	Nodular 3	
	Scar regret	Absent 0	Present 1			
C ³	Color	Exact match 0	Minor mismatch 1	Major mismatch 2	Complete mismatch 3	
	Contour	Same level 0	Depression 1	Elevation 2		
	Corrections If needed	None 0	Nonsurgical 1	Surgical 2	Combination 3	
A ³	Any distortions (Static/Animation)	Absent 0	Present 1			
	Associated pain	Absent 0	Present 1			
	Associated pruritis	Absent 0	Present 1			
R ³	Reactions by others	Unnoticed 0	Barely Noticed/Ignored 1	Unhappy 2	Shocked 3	
	Regularity of scar	Regular 0	Irregular 1			
	Recommendation to others	Yes 0	Neutral 1	No 2		

Table 6 Recommendations

Whom to recommend?
1. Cystic lesions on face (infected and noninfected).
2. Sebaceous cyst irrespective of the size and located anywhere on the body.
3. Noncystic superficial lesions and multiple lesions amenable to punch incision.
4. Smaller lesions where scar can easily blend in natural/surrounding imperfection (especially in and acne scars).
5. Concave areas on face.
6. Older patients.
7. Lastly, where active surveillance is needed (especially in suspicion of malignancy).
Whom to avoid?
1. Large lesions other than epidermoid cyst on convex areas of face.
2. Areas with near anatomical margins, which can be distorted as the cicatrix contracts.
3. Noncystic big and deep lesions more than 6 mm in diameter.

hyperpigmentation (PIH) subsided by 6 to 12 weeks with routine use of moisturizer and sunscreen. PIH which persisted for more than 3 months (28 patients) was managed with 6% glycolic acid and tretinoin 0.025% cream along with sunscreen. PIH was seen mainly in inflamed lesions and in lesions with the punch size of more than 5 mm in diameter. Currently, all our patients are on a regular follow-up with none requiring scar revision (→ **Table 3**). On the application of SCAR³ facial scar scoring scale our average score was 6 (range, 4–9).

Discussion

Punch creates a uniform and architecturally most basic shape—a *circle*.⁴ Circular wounds created by punch incision tend to produce more uniform circular centripetal contraction thus further minimizing the total defect. This consequent circular scar is easy to camouflage in patients having acne scars or any other textural abnormalities as against a linear scar. In fact, in majority of the cases it may just appear as a small dot by 1 to 2 years, which can easily blend-in with the surrounding irregularities like acne scars. Once the wound fully contracts, the residual defect is filled-in/bridged by deposition of collagen and fibrous connective tissue—the scar tissue. A sub-centimeter wound under favorable circumstances contracts by 70% and the rest is filled in by the scar tissue so the final cicatrix is small.⁵ *PISH* technique creates a small incision length which eventually leads to reduced scarring without compromising the efficacy, a similar finding observed by Lee et al, in a prospective randomized trial while comparing punch incision and elliptical incision for noninflamed sebaceous cyst.⁶ The degree of cutaneous wound contraction depends upon the preliminary wound size, site, surface, adjoining skin laxity, depth, and underlying muscle.⁷ To tackle this primary determinant of size, various methods of area reduction like tissue under-mining with purse string closure and its modifications have been described in the literature with good outcome.⁸ In punch size of 5 mm and more we recommend 2 to 3 mm subcision just at the edge which can lead to better progress and effective wound contraction.

Conventional elliptical incision requires removal of extra skin for smooth tapering of its edges to prevent standing

cone deformity which causes the defect to enlarge and may encroach onto the adjacent facial units which is not observed in PISH technique. This is of overwhelming benefit while dealing with facial lesions.^{6,9} Multiple concurrent occurrences of facial lesions can present a unique challenge to the attending surgeon which can be easily managed with the PISH technique.

While studying the advantages of healing with secondary intention on face, Zitelli observed, wounds over concave surface of face like nasolabial fold, nasolalar sulcus, medial canthal area, and alar crease heal with imperceptible scar and wounds over convex areas heal with variable results.^{5,7,10} This may be attributable to thicker/denser dermis which has more collagen and elastic fibers preventing optimal wound contraction. Similarly, in our study superficial wounds over concave surfaces healed early and beautifully while the deeper wound on the same area also healed with good aesthetic outcome. Senile skin has less collagen and elastin, more laxity, more surface irregularities (rhytids), and more pigmented irregularities making them perfect candidates for healing by secondary intention.⁷ Re-pigmentation of a scar, although poorly understood, in our study we observed that superficial wounds (small and large) had good/satisfactory re-pigmentation, while deeper wounds were unpredictable. This could be due to the fact that superficial wounds had some adnexal elements especially hair follicle which were reservoir of melanocytic stem cells.¹¹ With time, remodeling occurs making the scar eventually smaller, hypopigmented, and at the same level or slightly depressed off the surrounding. Lastly, if the need for scar revision arises after PISH technique, the total scar length may be smaller as compared with an elliptical incision planned for the initial lesion.

Although various minimally invasive ablative techniques like radiofrequency ablation and CO₂ laser ablation have been described to treat facial lesions, these methods are not cost effective and require sophisticated instruments¹²⁻¹⁴ The excessive production of heat due to laser or radiofrequency carries a potential risk of undesirable dyspigmentation.¹⁵ On the other hand punch incision with excision is an easy, cost effective technique to perform which does not require sophisticated instruments.

In our series, recurrences were observed in infected sebaceous cyst and dermoid. They were eventually managed with conventional elliptical incision. On retrospection, we learnt the lesson of thoroughly inspecting the wound cavity particularly its edges, with the help of two skin hooks especially in sebaceous cyst measuring more than 2.5 cm diameter under adequate illumination and loupe magnification. Based on our experience, we recommend the use of this technique for noncystic lesions up to 4-mm punch size. For noninfected cystic lesions we recommend 3 to 4mm punch. For infected sebaceous cyst and large cystic lesions, we advocate using punch of 4 or 5 mm and patiently assessing the cavity for remnants and if necessary two, 1 to 2 mm supplementary incisions approximately 180 degrees apart can be placed perpendicularly along the RSTL which can make dissection easy. Advantages of PISH technique are shorter learning curve, easy to master with reproducible results, lesser operative time, smaller incisions without compromising the

safety with equally good or better aesthetic outcomes using basic and easily available biopsy punch. Since these lesions are slow growing and frequently ignored, a longer follow-up is recommended. Based on our experience we have following recommendations (► Table 6).

Conclusion

PISH, a minimally invasive technique described here could offer a modern-day answer to numerous facial lesions. It is simple and safe method with good cosmetic outcomes. In selected patients it has a potential to replace conventional fusiform excision. Appropriate patient selection remains the ultimate key to success for using this method.

Conflict of Interest

None

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