Surgical management of Basal cell carcinomas (BCC) of the Head and Neck

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Abstract:

Ninety six consecutive cases of BCC of the face and head and neck were managed during 8 years. 51 patients were female and the rest were male. The average age of presentation was 64Years. The size of majority of lesions (85%) were less than 10mm. Lesions appeared mainly on mid face around the nose, inner canthus and forehead. 10.5% had multiple lesions on presentation. All lesions were managed surgically by total excision of the lesions with 5mm free healthy skin margin and the defect reconstructed simultaneously by various types of local or distant skin flaps. The effectiveness of this procedure was 94% cure rate. The average follow up was 2 years (9-36 months). Ten patients(10.4%) required second surgical resection as they developed recurrence at the site of primary resection. Eleven patients (11.4%) showed another lesion on the face during follow up period. Surgical resection and primary reconstruction of BCCs of the head and neck are highly recommended and give good success and high percentage (around 94%) of cure rate. Long term follow up is recommended as new lesions or recurrence may appear years after management.

Keywords: BCC, skin cancer, surgical management / Abbreviations: BCC = Basal cell carcinoma. L A= local anesthesia. G A = general anesthesia. EDC = electrodessication and Curettage.

Objective: To analyze the result of surgical management of BCC of the Head and Neck with primary resection and reconstruction using various skin flaps, to report the rate of recurrences after such therapy and to report the age and gender distribution of such disease in our Kurdistan region.

INTRODUCTION:

Basal cell carcinoma is the most common type of skin cancer. Although it has been said that BCCs never metastasize or kill yet metastatic cases have been reported [1,2]. However it is still considered malignant because it can cause significant local destruction and disfigurement by invading surrounding tissues [3] (photo1). In 80 percent of all cases, basal cell cancers are found on the head and neck [4].

Basal cell carcinoma is occurring mainly in fair-skinned patients with a family history of this cancer. Sunlight exposure is a predisposing factor in about two-thirds of these cancers [5]. One-third occur in non-sun-exposed areas emphasizing the genetic susceptibility of basal cell cancer patients [6].

BCCs divide to 3 groups, based on location and difficulty of therapy:

1. **Superficial basal cell carcinoma**, or some might consider to be equivalent to "in-situ" cancer. It is the only type of basal cell cancer that can be effectively

treated with topical chemotherapy, such as Aldara, or Fluorouracil.

2. **Infiltrative basal cell carcinoma**, which often encompasses morphea form and micronodular basal cell cancer. More difficult to be treated with conservative treatment methods, and it requires surgical excision.
3. **Nodular basal cell carcinoma**, which essentially include the remaining basal cell cancer lesions and usually they require surgical excisions.

Photo 1: BCC local distraction.

Photo 2: Superfecial BBC.

Photo 3: Rodent ulcer, nodular type.

The following methods are employed in the treatment of basal cell carcinoma (BCC). Treating surgeons will recommend one of these modalities as appropriate treatment depending on the tumour size, location, patients age, and other variables.

- **Standard surgical excision** with either frozen section histology, or paraffin embedded fixed tissue pathology. This is the preferred method for removal of most BCCs. The cure rate for this method is totally dependent on the surgical resection margin (skin removed that is free of visible tumor). When standard surgical margin is applied (usually 4 mm or more), a high cure rate can be achieved with standard excision [8,9,10].

Usually the rule of thumb is if a 4 mm free surgical margin is obtained around a small tumor (less than 6mm), or a wider 6 mm free surgical margin is obtained around a larger tumor (greater than 6mm), the cure rate would be very high - 95% or better [11,12].

The narrower the free surgical margin the higher the recurrence rate[12,13,14]. A weakness with standard surgical excision is the high recurrence rate of basal cell cancers of the face, especially around eyelids [15], nose, and facial structures [16].

With surgical margin controlled frozen section histology, a surgeon can achieve a high cure rate and low recurrence rate [17]. If for cosmetic reasons, only very small surgical margins 1–2 mm is resected, a high recurrence rate of up to 38% might occurs [18, 19, 20]. When one does not utilizing frozen section, the patient might have to wait a week or more, before informing the patient if more tumour is left or if the surgical margin is too narrow, and a second surgery must be

performed to remove the residual or potential residual tumour [21].

- **Mohs surgery**: Mohs surgery (or Mohs micrographic surgery) is an outpatient procedure in which the tumor is surgically excised and then immediately examined under a microscope. It is claimed to have the highest cure rate of 97% to 99.8% by some individuals [22,23]. The base and edges are microscopically examined to verify sufficient margins before the surgical repair of the site. If the margins are insufficient, more tissue is removed from the lesion until the margins become sufficient.
- **Chemotherapy**: Some superficial cancers respond to local therapy with 5-fluorouracil, a chemotherapy agent [24,25]. Topical treatment with 5% Imiquimod (Aldara cream) cream, with five applications per week for six weeks has a reported 70-90% success rate.
- **Radiation**: Radiation therapy is appropriate for all forms of BCC as adequate doses will eradicate the disease [26]. Radiation therapy can be delivered either as external beam radiotherapy or as brachytherapy (internal radiotherapy). Although radiotherapy is generally used in older patients who are not candidates for surgery, it is also used in cases where surgical excision will be disfiguring or difficult to reconstruct (especially on the tip of the nose, and the nostril rims).

Cure rate can be as high as 95% for small tumor, or as low as 80% for large tumors [26]. Usually, recurrent tumors after radiation are treated with surgery.

Photodynamic therapy:

Photodynamic therapy is a new modality for treatment of BCCs, which is administrated by application of photosensitizers to the target area. When these molecules are activated by light, they become toxic, therefore destroy the target cells. Methyl aminolevulinate is approved as a photosensitizer since 2001. This therapy is also used in other skin cancer types [27].

- **Cryosurgery**: Cryosurgery is an old modality for the treatment of many skin cancers. When accurately utilized with a temperature probe and cryotherapy instruments, it can result in very good cure rate [28,29]. Disadvantages include lack of margin control, tissue necrosis, over or under treatment of the tumor, and long recovery time.
- **Electrodessication and curettage**: or EDC is accomplished by using a round knife, or curette, to scrape away the soft cancer. The skin is then burned with an electric current. This further softens the skin, allowing for the knife to cut more deeply with the next layer of curettage. This cycle is repeated 3 to 5 times, and the free skin margin treated is usually 4 to 6 mm. Infiltrative or morphea form BCCs can be difficult to eradicate with EDC. Generally, this method is used on cosmetically unimportant areas like the trunk (torso). The cure rate can be low or high, depending on the aggressiveness of the EDC and the free margin treated [30,31].

Patients and Method:

Cases of suspected skin lesions for cancer in the head and neck managed by one surgeon in a clinic were collected. Patients were referred from primary health care Doctors, dermatologist or attended directly to our center.

Data for age, gender, occupation, exposure to radiation and ultraviolet sun light and habit of smoking, size and site of the lesion were prospectively collected and computerized.

Suspected lesions for BCC were subjected for surgical excisional biopsy, by total resection of the lesion and at least 5mm gross healthy margin. The defect reconstructed directly in the same session either by primary closure, local skin flaps, pedicle flaps or by free skin grafts (see below for detail of each surgical procedure).

Huge lesions which required major resection and reconstruction where subjected for incisional biopsy to verify the diagnosis first, before planning major resection. Resections and reconstructions were done by the same surgeon utilizing various local and distal flaps or free grafts (see surgical procedures below).

Procedures in the majority of cases were done under local anesthesia (LA).

Surgical procedure:

The lesion gross out line was marked by dots, then about 5mm free healthy margin marked by a continuous line. The proposed reconstruction flap marked at the same time (Figure 1).

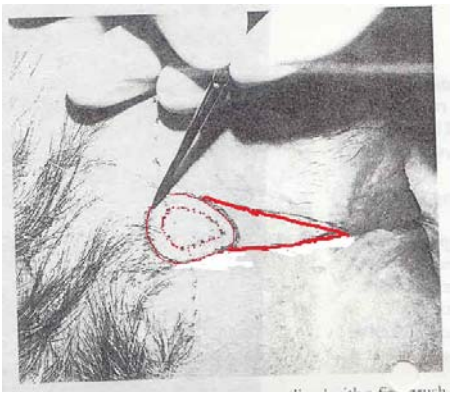


Figure 1. marking the lesion, dots for gross macroscopic out line and continuous line for resection site and reconstruction.

Then Lidocain 1% with 1/80000 epinephrine infiltrated around and deep to the lesion using 4-10 ml depending on the size of the lesion and body weight. The lesion totally excised and repair of the defect was done.

Specimens were marked by putting a stitch at the 12 o'clock site of the lesion to orientate the pathologist with the location of the lesion, and sent for histological verification to see if complete resection has been performed, (Figure 2).

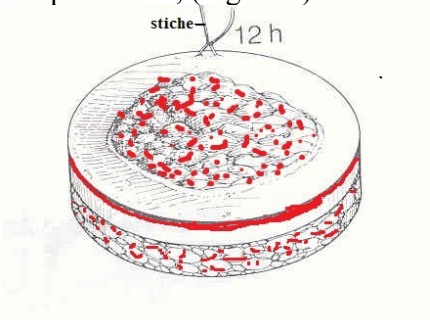


Figure 2: Lesion removed and marked in direction of 12 o'clock.

Post-operative plan for follow up was arranged. The objective for follow up was: to record the recurrences at the site of the resection, to record any new lesions appeared in the head and neck and to plan for new surgical resection of such recurrence or new lesions.

Follow up plan was based on the pathological reports. Patients who had completed surgical excision of the lesion, or when the pathologist reported that the margin of resection is narrow(1mm or less), these patients (total 88 cases) were booked for follow up every 2 months for the first year. Every 3 months for the 2ed year and twice per year for the 3rd year. Whenever recurrence was suspected, patients were advised for new excision of the lesion.

When the pathologist reported that there is incomplete excision of the lesion and pointed out the direction and site of the residual tumour cells, these patients (total 8 cases) were informed and advised for immediate second excision procedure of the remaining lesion to clean the margin of excision from remaining tumour cells.

Results:

Ninety six consecutive cases of BCCs of the face were seen in 8 years. Fourty five were male and 51 female (chart 1). The age range was 37 to 91 years with the main age of 64years. All of them gave history of sun exposure either being farmer or exposed to sun during swimming or during summer.

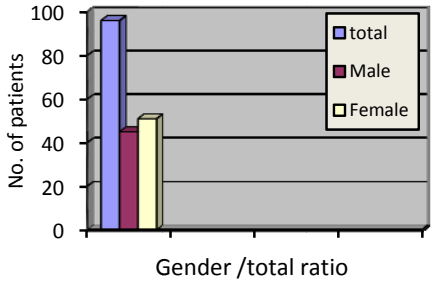


Chart 1: Total No of Patients and gender ratio

Majority of lesions were located in the mid face, see figure 3 and table 1.

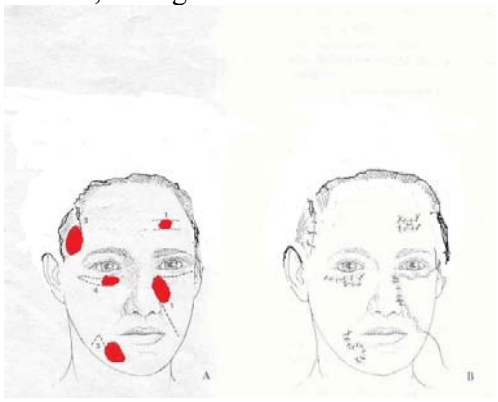


Figure 3: lesions are mainly in mid centre of the face.

Table 1 distribution of lesions on the face.

Site of lesions	No. of lesions
Nose	28
Glabella	16
Eyelids	13
Forehead	10
Jaws	9
Cheeks	8
Lips	6
Others	6
Total	96

The size of the lesions ranged from 4mm to 140mm. More than 85% of lesions were less than 10mm. see Chart 2.

Chart 2 Number of lesions according to **the size**

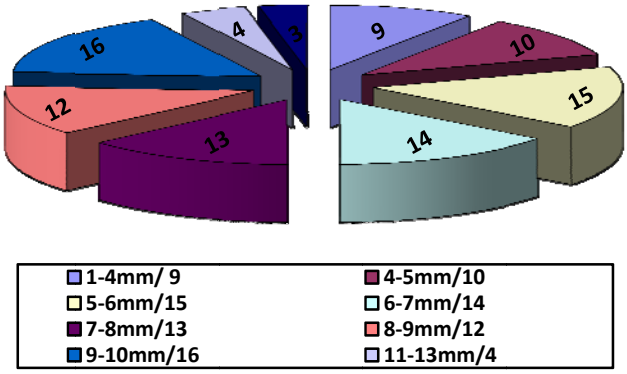


Chart 2: Size in mm and numbers of lesions

Ten cases (10.4%) on presentations had multiple lesions (Figure 3A).

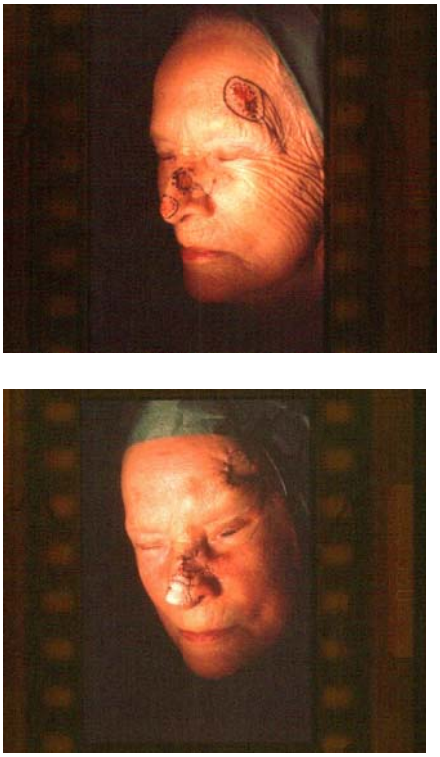


Figure 3A: multiple lesions, 3 lesions mid face, reconstruction done by 3 different ways.

Eighty eight cases were operated under LA while 8 cases under GA as they required long surgical procedure and pedicle distant flaps for reconstruction.

All cases which were operated under LA, reconstructions were done by either direct closure (Figure 4). or local skin flaps based on laxity and availability of nearby skin (figure 5).

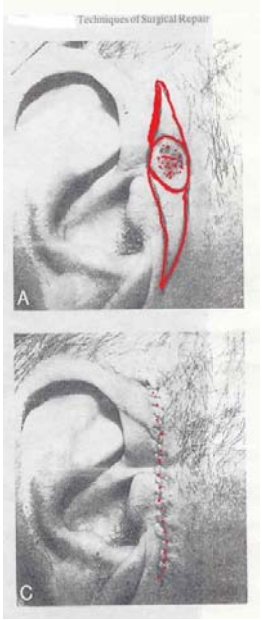


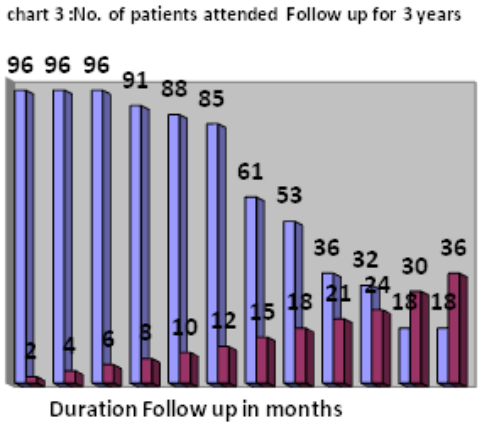
Figure 4: direct closure after resection of the lesion.

Figure 5: repair by local transposition flap

Lesions on tip of the nose reconstructed by full thickness free skin graft(figure 6), to avoid deformity tip of the nose.

Figure 6: lesion tip of the nose, repaired by full thickness free skin graft.

Four cases (4.16%) required second surgical procedure 1-2 weeks after initial operation as pathologist reported incomplete resection and presence of tumour cells at the margin of resection.
Follow up period was from 9months to 3 years. Only 18, (18.75%) cases attended 3 years follow up, because they regarded themselves been cured and they had no new or recurrences (see Chart 3).



Eleven patients showed another lesion on the face during follow up period and required new surgical resections.

Six patients (6.25%) developed recurrence at site of previous resection, of these 3 were around eyes and the others were on dorsum of the nose. All these recurrences were recorded after 6 months from the resection and their histopathological report showed narrow margin of resection on their excised specimens.

Discussion

Basal cell carcinoma grows slowly and is painless. A lesion that bleeds easily or does not heal well may be suspected for BCC. The majority of these cancers occur on areas of skin that are regularly exposed to sunlight or other ultraviolet radiation as

in the mid face[32]. They may also appear on the scalp. All managed cases gave in the history long duration of exposure to the sun light either due to their occupations (farmers) or as a social hobbies (swimming for long duration under summer vacations). All cases had lesions on the mid face,where exposure to sun is intense.

Basal cell skin cancer used to be more common in people over age 40 [33], our cases (more than 90%) seen in senile and after age of 50years, as long period and repeated exposure to sunlight are required to introduce the malignant changes in the skin.

Basal cell skin cancers almost never spread, but metastatic cases has been reported. If left untreated, it may grow into surrounding areas and destroy nearby tissues and bone [1,2]. We have not recorded metastases in our cases. Multiple lesions on the face are common,and new lesions may appear during various years of follow up, as the predisposing factors causes wide and diffuse skin changes which is not localized to one site [34]. Ten patients (10.5%) of cases had multiple lesions on the face on initial presentation.

The rate of recurrence reported to vary between 6-10% [35]. In this study six patients (6.25%) developed recurrence at sites of previous resections, during the 3 years period of follow up.

The criteria for surgical treatment varies depending on the size, depth, and location of the lesions. The aim was to excise the tumour radically with gross 5 mm free margins and to reconstruct the defect with the least cosmetic deformity, taking into consideration to put the line of resection in or parallel to normal skin creases (figure 7), and to do good undermining of surrounding tissues (figure 8), when direct closure was applied for closure of the defect (figure 9).

Figure 7 normal skin creases

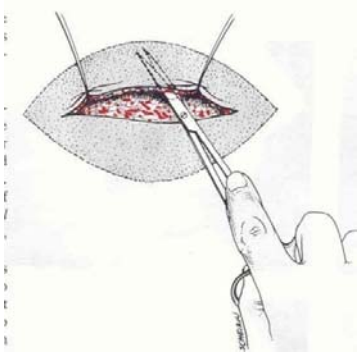


Figure 8: good undermining

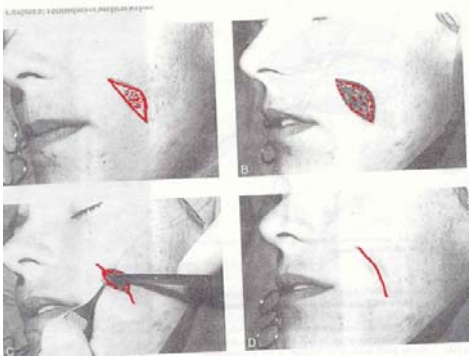


Figure 9 direct closure of the defect in the skin creases

Bases on these criteria various reconstruction procedure were used, with the aim of total excision of the lesions and least cosmetic deformity at resection sites (see Table 2).

Table 2: Reconstruction procedures used according to site and size of lesions.

No of lesions	Site of the lesions	Reconstruction procedures used
16	Glabella	Local skin flaps
13	Eye lids	Direct v-closure /local flaps
12	Tip nose	Free full thickness skin grafts
10	Forehead	Local skin flaps
9	Jaw	Local skin flaps
8	Cheeks	Direct closure/ local flaps
8	Ala nasi	Composite graft from ears
5	Dorsum nose	Pedicle forehead flaps
4	Scalp	Pedicle flaps
3	Margin nose	Local skin flaps
3	Lips large lesion	Pedicle flaps from lip
3	Lips small lesions	Primary closure
2	Mastoid	Free full thickness skin graft

Composite and free skin grafts were taken from external ear (figure10) and the skin over the mastoid.

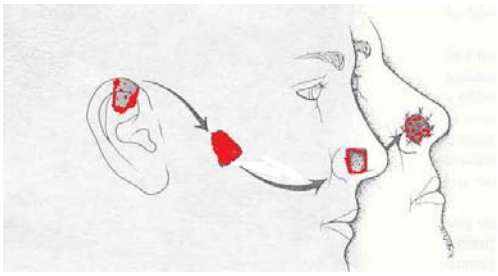


Figure 10 composite graft from pinna to the nose defect.

When the defect was closed by local adjacent flaps, consideration was given to good closure with least tension at the repaired site.
Various flaps used for reconstructions including:

L-shaped flap (figure 11),

Figure 11: L-shaped flap

H-shaped flaps for forehead (figure 12),

Figure 12:H-shaped flap.

Nasolabeal flaps (figure 13),

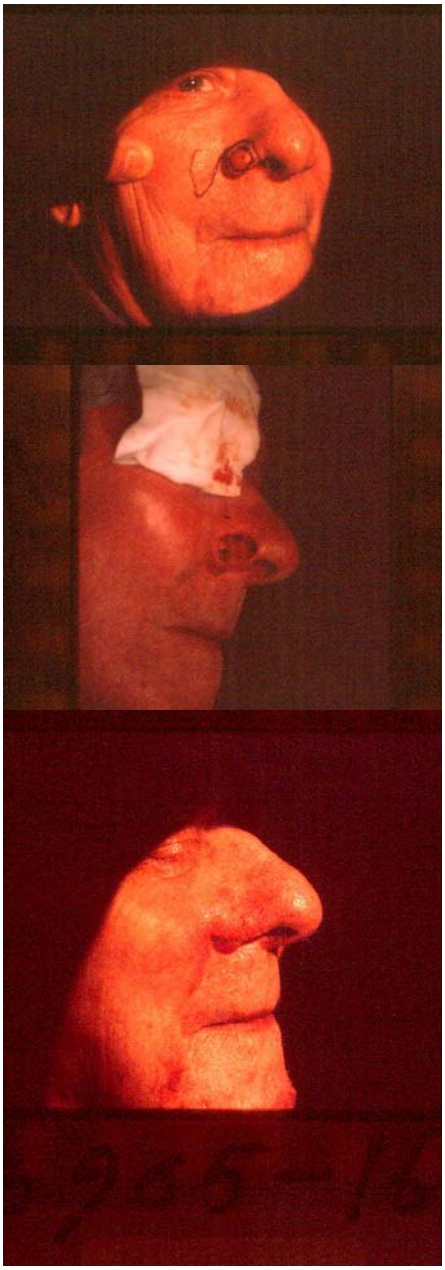


Figure 13: Nasolabial flap for repair of ala nasi lesions.

Glabellar flaps for root of the nose (figure 14)

Figure 14: glabellar rotational flap

Rotational flap for scalp lesions (figure15),

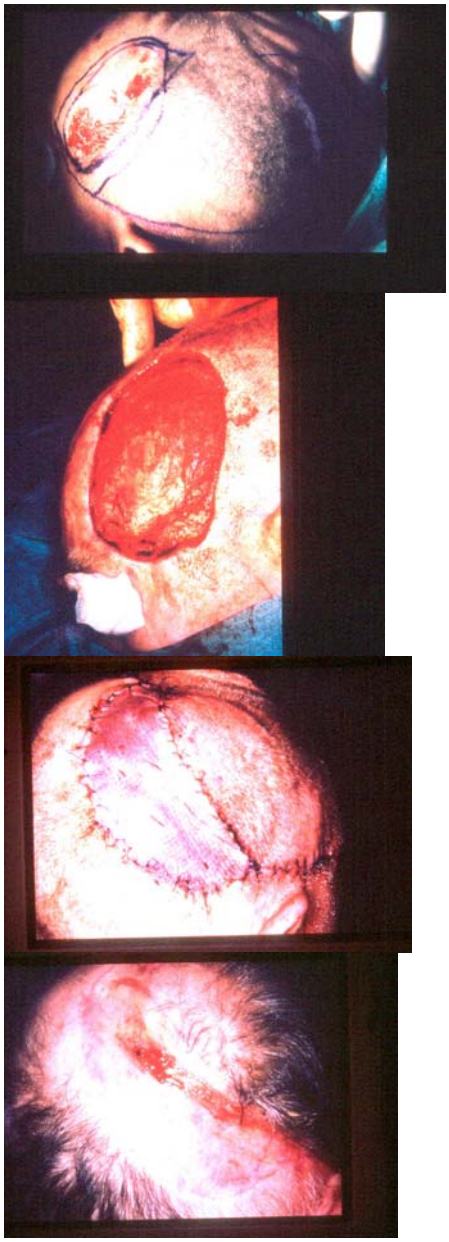


Figure 15: Rotational scalp flap for repair of scalp lesion. Notice, posterior scalp defect is closed by partial thickness free skin graft

kite flap for temporal and cheek lesions (figure16),

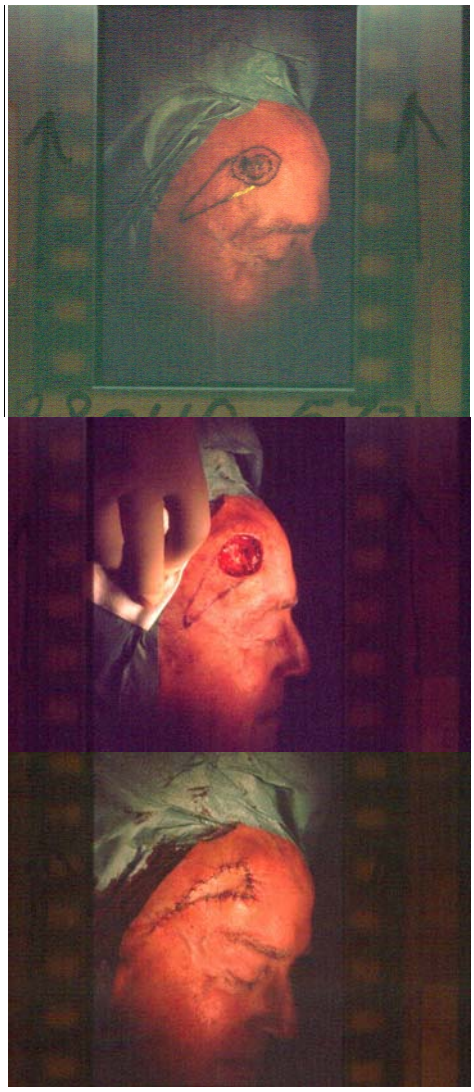


Figure 16: Kite flap for repair of lateral forehead lesions**.**

Nasofrontal flaps for lesions on the dorsum of the nose(figure 17),

Figure 17: Nasofrontal flap is used for reconstruction of nasal lesion.

and Abbe-Estlander lip flaps for lip lesions (figure 18).

Figure 18: Abbe-Estlander lip flaps for lip lesions, 1. The lesion.2 drawing flap for repair from upper lip. 3. Flap for repair stitched in position. 4, two weeks after repair. 5. Separation of the pedicle under LA after 3 weeks. 6. Final result.

Repairs by pedicle flaps done in two stages with an interval of 3-4 weeks between. We mainly used forehead pedicle flaps based on the terminal branch of external carotid artery for repair of mid face lesions (figure 19).

Figure 19: Repair nose lesion by forehead pedicle flap: 1. The lesion. 2 drawing resection site and the flap for repair. 3. forehead flap sutured in place. 4. Cutting the pedicle after 3 weeks and re suturing the excess to the fore head. 5and 6. The final result.

The effectiveness of these techniques resulted in a cure rate around 94 percent which is similar to international records, 95% cure rate[36]. and 93% cure rate by surgical excision versus Moh's procedur [37,38].

Conclusion

BCCs of the face are slow growing tumours.Commonly affecting mid face. Skin exposure to sun light is one of a common predisposing causes. Surgical excision with a 5mm free margins is recommended as the treatment of choice in the first hand. This gives a good percentage of cure rate. As most of cases presenting in elderly and senile patients, whom they have excessive loose facial skin, resection and reconstruction can be done by direct closure or by utilizing various local skin flaps. All specimens must be subjected for pathological examination to verify complete radical resection of the tumour. Long term follow up is advised as recurrence or new lesions may appear and require new resection.

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پوختە

نەوەد و شەش حاڵەتی شێرپە نجەی پێست بینراوە لە ماوەی هەشت ساڵدا. ئەم شێر پە نجانە تۆشی دەم وچاو و سەر بوون، پە نجا و یەك كەسیان مێ و ئەوانی تریشیان نێر بوون. 85٪ لەم شێرپە نجانەی پێست لە 10 ملم بچوكتر بوو ، وە 10.5٪ لە نەخۆشەكان زیاتر لە یەك شێرپە نجە هەبوون لە دەم و چاویان كاتێك بۆ یەكەم جار بینران. هەموو ئەم شێرپە نجانەی پێست چارەسەر كران بە نەشتەرگەری كە بریتی بوو لە لابردنی نەخۆشیەكە لەگەڵ 5 ملم پێستی دەوروبەری شێرپە نجەكە. شوێنی هەڵگرتنی ئەم شێرپە نجەیە بە پێستی نزیك بە نەخۆشیەكە لە دەم و چاو پركرایەوە و داپۆشرا. نەخۆشەكان دوای نەشتەرگەریەكە بە رێك و پێك بینرانەوە تاكو (3) ساڵ. دە نەخۆش پێویستی بە نەشتەرگەری دووەم بوو چونكە شێرپە نجەكە لێ ی گەڕایەوە لە شوێنی نەشتەرگەری پێشوی, یانزە نەخۆشیش لەكاتی سەردانیان دوای نەشتەرگەریەكە، شێرپە نجەی تر دروست بوو لە دەم و چاویان و پێویستی بە نەشتەرگەری نوێ ی كرد. ئەم جۆرە چارەسەركردنە 94٪ لە نەخۆشەكان بە تەواوی چاك بوونەوە ، وە ئێمە ئەم جۆرە چارەسەركردنە بە رێگەیەكی زۆر باش ئەزانین بۆ چارەسەركردنی شێرپە نجەی پێستی دەم و چاو.