Treatment of Basal Cell Carcinoma by Electrodesiccation and Curettage

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BASAL cell carcinoma (basal cell epithelioma, rodent ulcer, non-keratinizing carcinoma) is an epithelial new growth arising from the epidermis or its appendages and having certain reasonably well-defined clinical and histopathological features.

This report concerns the treatment of these lesions by electrodesiccation and curettage.[1, 2] In addition, a clinical and histological classification is presented which has some significance in the choice of the method of treatment.

This subject will be considered under four headings: (I) *Classification* of basal cell carcinoma; (II) *Detail of technique* of electrodesiccation and curettage; (III) *Results of therapy* by electrodesiccation and curettage; and (IV) *Advantages and disadvantages* of electrodesiccation and curettage as a method of treatment.

I. CLASSIFICATION

A. Common Basal Cell Carcinoma: (1) Actinic (solar and ionizing); (2) Basal Cell Nevi; (3) Miscellaneous.

B. Sclerosing Basal Cell Carcinoma.

C. Superficial Multicentric Basal Cell Carcinoma.

The following discussion of this classification is not intended to be a detailed and exhaustive study of basal cell epitheliomas. Rather, it is intended to illustrate those clinical and histological features which may have significance in the choice of method of treatment.

A. Common Basal Cell Carcinoma (Figs. 1 and 2)

1. Actinic

This is by far the most common variety. The basic lesion is a pearly nodular dermal infiltrate of varying size and shape. Ulceration may or may not be present. The lesion is slow-growing and non-metastasizing. Previous sun damage to surrounding skin is usually present, e.g. in the form of telangiectatic blood vessels, atrophy, and areas of hypo- and hyperpigmentation. The more the exposure to sun and the lighter the skin colour, the earlier in life these tumours appear. Blond outdoor workers (farmers, sailors, ranchers) are common victims. Basal cell carcinoma may also arise in skin damaged by radiotherapy.

When these tumours are small, it may be difficult to make a clinical diagnosis. Sometimes putting

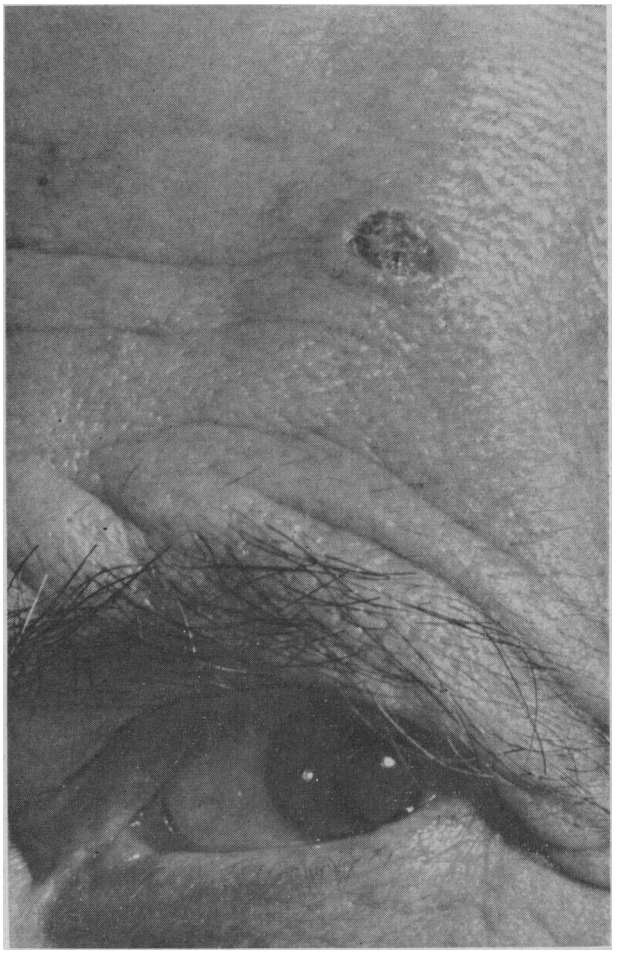

Fig. 1.—Common basal cell carcinoma, forehead. Note pearly raised border with central area of necrosis. This lesion was treated by electrodesiccation and curettage.

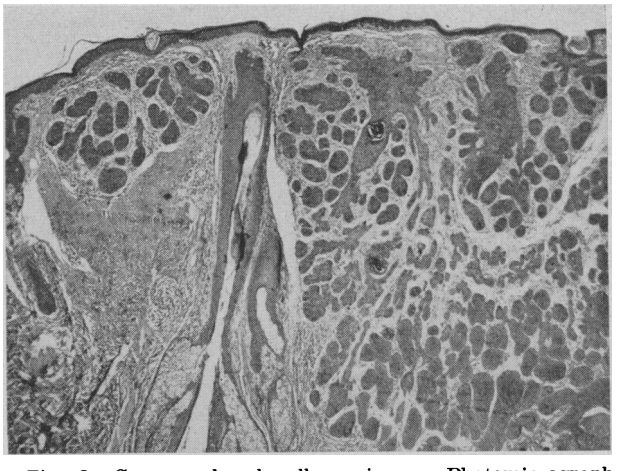

Fig. 2.—Common basal cell carcinoma. Photomicrograph showing a cluster of tumour islands at the periphery and separated from the main tumour mass by a hair follicle. Approximately 40×. All sections are stained by hematoxylin and eosin.

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From the Ottawa Civic Hospital Clinic of the Ontario Cancer Treatment and Research Foundation. Director, Dr. G. T. Stoddart.

tension on the skin about the tumour may make the nodule more easily seen. The difficulty is especially noticeable on the nose, where the thick "sebaceous" texture of the skin may make a clinical diagnosis uncertain and makes it more difficult to determine the exact extent of the tumour. The authors maintain that clinical diagnosis must be confirmed by biopsy in all cases.

Histologically, most basal cell carcinomas show in some areas uniform, rounded groups of basal cells with a single peripheral layer of pallisaded cells. These findings must be considered as the basic pattern. There is much variation, however, with areas resembling hair follicles, sebaceous gland cells and squamous cells frequently being present.

Certain histological findings may have importance in planning therapy:

a. Many basal cell tumours have two or three areas of direct continuity with the overlying epidermis. Occasionally one of these will be at the periphery of the lesion and form a small flask-shaped downward protuberance located at a distance from the main tumour mass. Most recurrences occur at the periphery, and it is our opinion that some may be explained by the presence of these small satellite lesions.

b. Some basal cell carcinomas are of the iceberg type in which some of the dermal portion extends laterally for some distance, resembling a pseudopod.

c. The presence or absence of ulceration is of no help in deciding which type of treatment should be used.

d. Melanocytes are present in these tumours and may or may not produce pigment. Its presence or absence means nothing as regards the clinical course of the basal cell carcinoma, but it is important clinically, as a pigmented basal cell carcinoma may be misdiagnosed and treated as a malignant melanoma. Lever[3] has stated that, if melanin pigment stains are done, almost all basal cell carcinomas will show some pigment.

e. Histological examination of slides of basal cell carcinomas which were fatal may show no difference from sections of basal cell carcinoma from patients whose lesions were very slow-growing (e.g. 0.5 cm. in 10 years). It is our opinion that history and clinical examination are of more help than the histopathology in predicting the course of a particular basal cell carcinoma.

(2) Basal Cell Nevi

Basal cell nevi is one of the terms used to describe an inherited condition which consists of multiple basal cell cancers, jaw cysts and congenital rib abnormalities. This subject has recently been reviewed by Gorlin and Goltz,[4] but it is not our purpose to describe this condition fully. Two illustrative cases will be presented briefly.

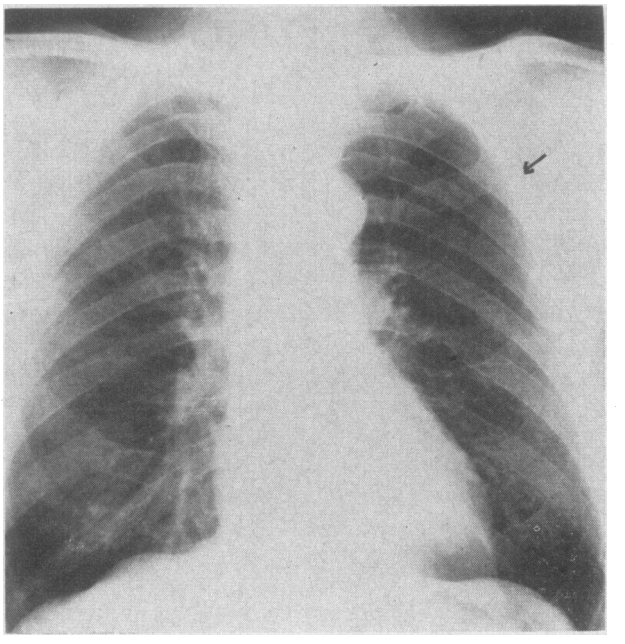

Fig. 3.—Case 1. Basal cell nevi. Arrow points to bifid rib.

CASE 1.—Mr. A.S., 43 years old, was first seen in September 1955, for multiple (about 20) tumours and ulcerated lesions located at various sites of the face and neck. These varied in size from 6 to 14 mm. Histological examination confirmed the clinical diagnosis of basal cell carcinoma. Most of the tumours were treated by electrodesiccation and curettage; a few by fractional x-ray therapy. Since 1955, many (about 30) new similar lesions appeared. Radiographs of the mandible showed many oval and round cystic cavities throughout the body and rami. The largest cyst measured 3 cm. in diameter. These lesions were radiolucent; they have no contents. Radiographs of the ribs and spine revealed multiple abnormalities of the vertebrae and ribs. There was one bifid rib (Fig. 3).

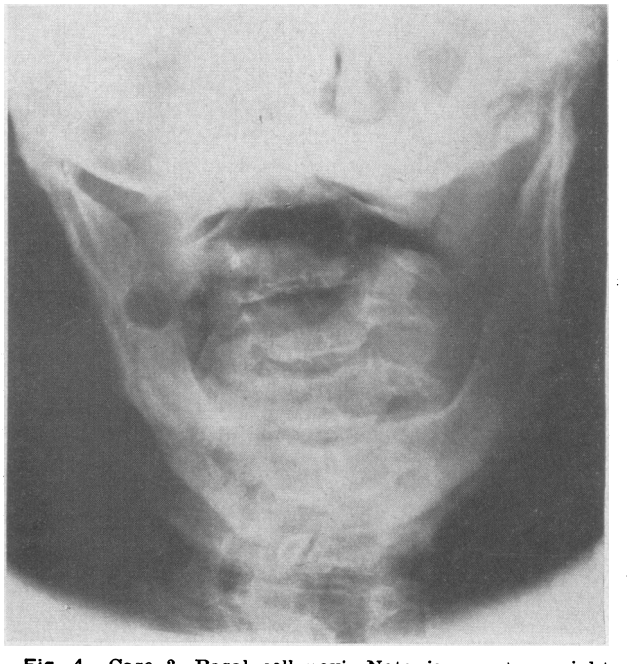

Fig. 4.—Case 2. Basal cell nevi. Note jaw cyst on right mandible.

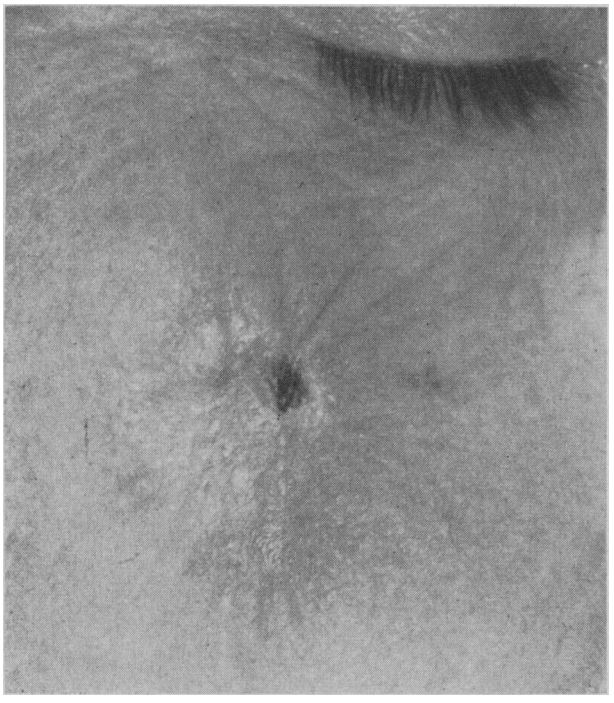

Fig. 5.—Sclerosing basal cell carcinoma. Shows rather poorly defined plaque on right cheek. This tumour is not amenable to treatment by electrodesiccation and curettage.

CASE 2.—Mr. A. T. died at age 65 of a brain abscess secondary to a penetrating basal cell carcinoma of the external ear canal. In addition, he had multiple basal cell carcinomas on his head, neck and torso, jaw cysts (Fig. 4) and a bifid rib. The corpus callosum was normal.

His son (H.T., aged 42) had multiple basal cell cancers on his face and torso; some were of the superficial multicentric type. Multiple jaw cysts have been removed by his dental surgeon. Histological examination of these jaw cysts shows a cystic cavity lined by normal-appearing stratified squamous epithelium.

His son, aged 12 (Mr. A.T.'s grandson), has had enucleation of jaw cysts on three occasions. He has no basal cell carcinoma at the present time.

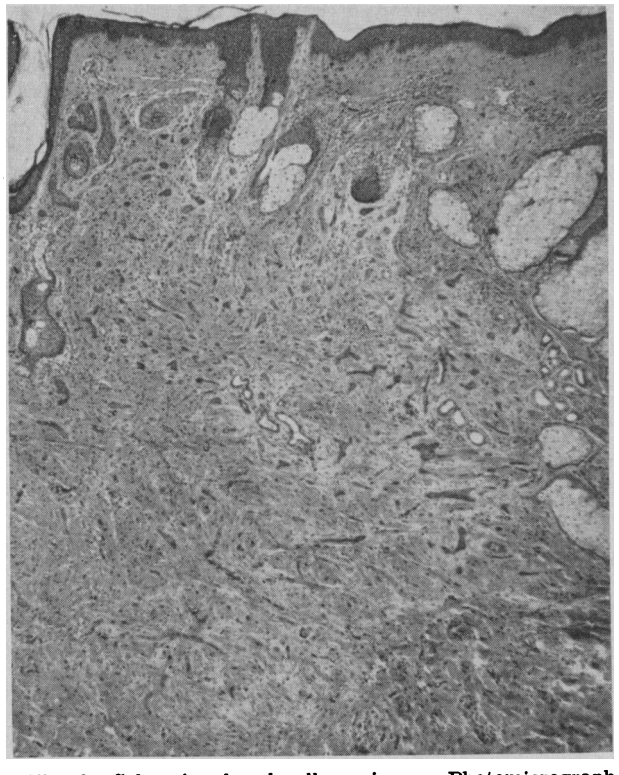

Fig. 6.—Sclerosing basal cell carcinoma. Photomicrograph showing fibrosis and strands of compressed atypical basal cells. Approximately 40×.

In this inherited disorder, basal cell carcinomas may arise in apparently normal skin. Frequently they begin much earlier than the period of late middle-age when basal cell carcinomas usually arise. It is important to examine other members of the family. Histologically, these tumours are no different from the previously described basal cell carcinomas except for the absence of solar elastosis in the skin.

(3) Miscellaneous

This group comprises those basal cell carcinomas not associated with actinic damage to the skin or with the associated findings of the basal cell nevi syndrome.

Basal cell carcinomas may occur in children. There have been reports of basal cell carcinomas occurring on the palms or soles, on mucous membrane and in skin not showing actinic damage. This miscellaneous group of lesions is very rare.

B. Sclerosing (Morphea-like) Basal Cell Carcinoma[5] (Figs. 5 and 6)

As the name suggests, this variety of basal cell carcinoma is distinguished from the other two types by the presence of extensive fibrosis.

Clinically, the lesions present as firm, very poorly demarcated plaques, usually located on the face. The surface may have a waxy yellow colour closely resembling a patch of localized scleroderma (morphea); they grow very slowly and often have reached a considerable size before being detected by the patient.

Histologically, this tumour consists of small islands and strands of basal cells between which there is dense fibrous connective tissue. In some areas the islands and strands may contain only four or five of the cancerous basal cells.

C. Multicentric Superficial Basal Cell Carcinoma[6] (Figs. 7 and 8)

Clinically, this type of basal cell carcinoma usually occurs on the trunk as multiple, superficial, circular, scaly or crusted lesions. Careful examination reveals a fine, pinhead-sized, pearly border. This indurated border can be more easily felt than seen. The tumour grows very slowly and only rarely becomes true invasive basal cell carcinoma. It may be one of the late cutaneous sequelae to prolonged arsenic ingestion. Confusion with a

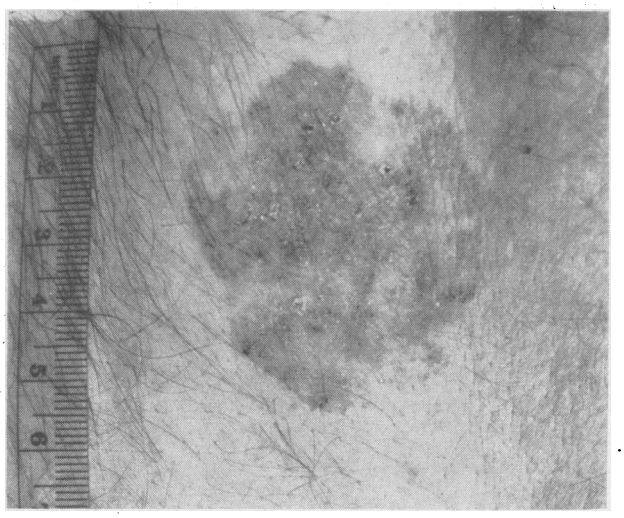

Fig. 7.—Multicentric superficial basal cell carcinoma. Lesion on back. This lesion can be treated by electrodesiccation and curettage.

patch of chronic dermatitis may easily occur. Histologically, there are multiple flask-shaped buds of basal cell carcinoma arising from the overlying epidermis. These buds rarely penetrate deeper than the upper half of the corium, i.e. about 0.6 mm. It seems most likely that this variety arises solely from the epidermis.

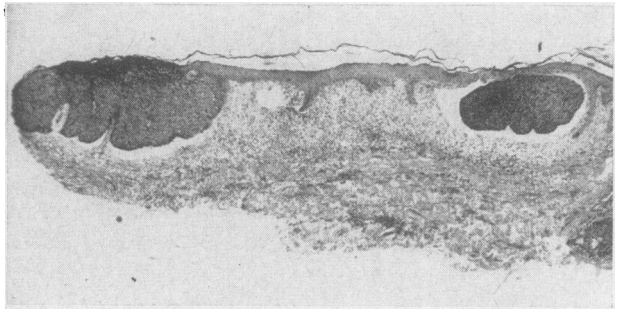

Fig. 8.—Multicentric superficial basal cell carcinoma. Shows two separate foci of tumour arising from epidermis. Approximately 40×.

The terms cystic, nodular, nodulo-ulcerative, papulo-pearly, button, etc. are often used to describe basal cell carcinoma. In the opinion of the authors these terms are purely descriptive and have no particular value in deciding on appropriate methods of treatment.

II. TECHNIQUE OF THERAPY BY ELECTRODESICCATION AND CURETTAGE

(Figs. 9 to 15)

We believe that a biopsy should be performed in all cases of suspected skin cancer, except in the most unusual circumstances. In our opinion, surveys of results of treatment based on large series of cases where only one-half or two-thirds of the lesions were biopsied are of little value. Biopsy requires the use of a small operating room and the usual

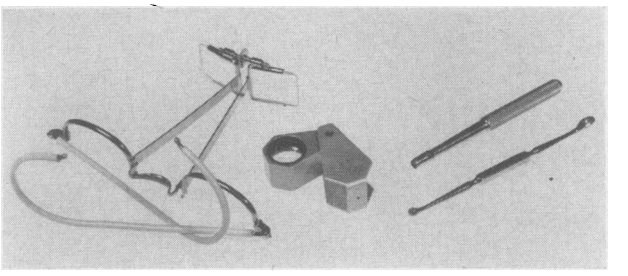

Fig. 9.—Binocular loupe, 8x hand lens, 4 mm. biopsy punch and double-ended cup-shaped curette.

equipment (syringes, scalpel, biopsy punches, scissors, formalin bottles, etc.).

Following the biopsy, in properly selected cases, the technique of electrodesiccation and curettage may be proceeded with, employing, in addition to the biopsy equipment, only a small cup-shaped

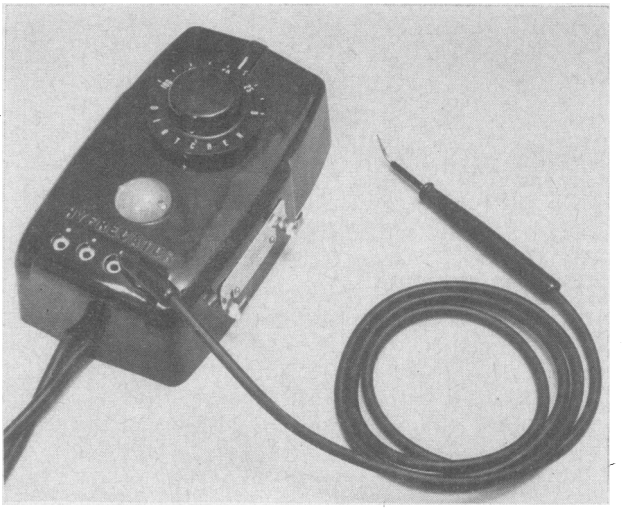

Fig. 10.—High frequency alternating current spark-gap diathermy unit.

curette and a binocular loupe. The curette should have a 3-mm. cup to scrape thoroughly the borders of the lesions, as this is the most likely location for recurrences. A cutting edge is not necessary. The

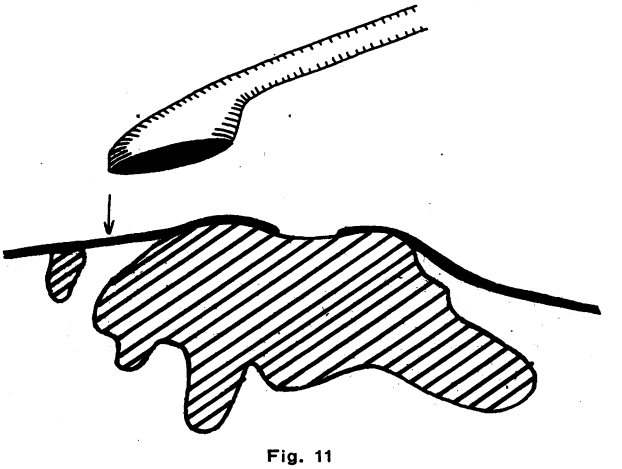

Fig. 11

Figs. 11-15.—Schematic representation of technique of electrodesiccation and curettage. Striped areas represent tumour.

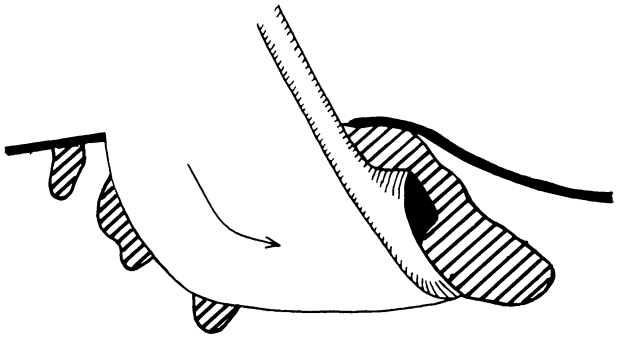

Fig. 12

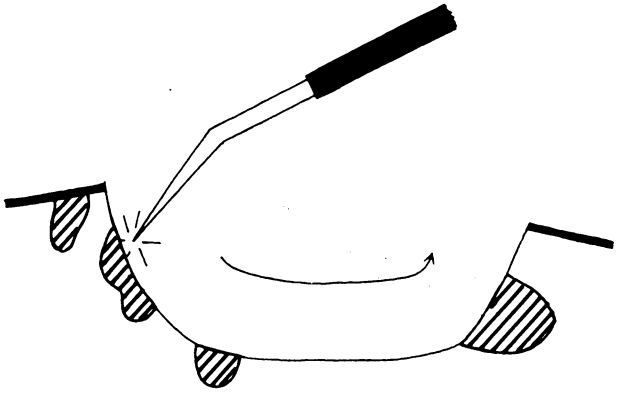

Fig. 13

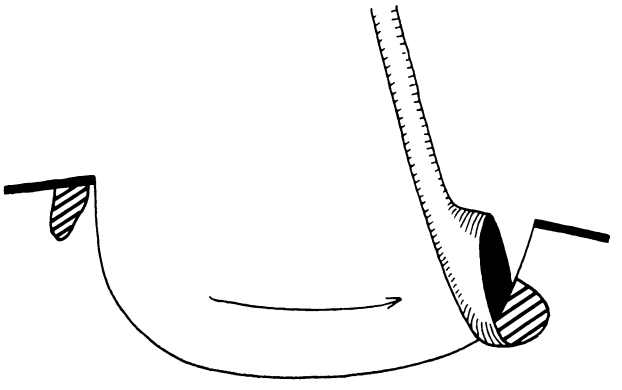

Fig. 14

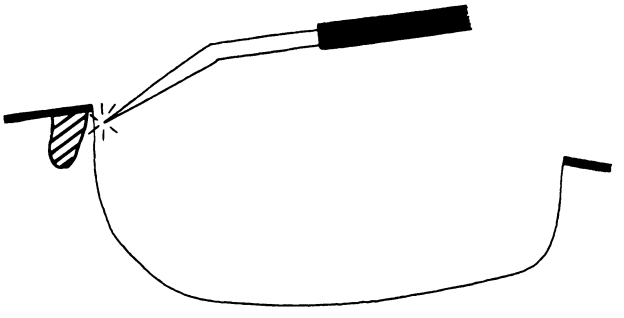

Fig. 15

binocular loupe or hand lens is used to check for visible residual tumour. The electrodesiccation is carried out with a small, spark-gap diathermy unit.

The procedure is as follows. Using a clean (non-sterile) surgical technique, the lesion is infiltrated with local anesthetic. A biopsy is performed using scissors, scalpel or a biopsy punch. The visible tumour is electrodesiccated and the lesion is then curetted. It is at once obvious that basal cell cancers have a soft mushy texture and bleed freely as a general oozing. The main portion of the tumour is then removed. The electrodesiccation is repeated, as is the curettage. The central portion of the tumour usually comes away easily. Attention must be paid to the periphery of the lesion. With the skin extended and with rather firm pressure, the curette is pulled across all of the border. Thus any little peripheral pockets of tumour will be removed. A useful confirmatory indication that all the tumour has been removed is the change in type of bleeding. The diffuse laking stops and only pinpoint capillary bleeding occurs, which is readily stopped by slight stretching of the skin. The lesion frequently has almost stopped bleeding at the end of the procedure. When no more tumour can be felt, the operative site is examined with the binocular loupe for residual tumour. If none is present, a final electrodesiccation of the whole lesion is performed, with special attention to the periphery. This is a very important part of this technique because, as previously mentioned, recurrences are invariably found at the periphery of the lesion. The number of times electrodesiccation and curettage is required will vary depending on the size and location of the tumour. At the conclusion of this procedure the operative site will present a dry sterile eschar. Bandaging is not necessary. If the wound is on the body, an antiseptic lotion may be applied.

In certain cases it is helpful to delineate the tumour before it is masked by the swelling from the local anesthetic. This is done by examination under a bright light with the aid of a hand lens or binocular loupe. Putting the skin on slight tension frequently makes the outlines clearer, as the tumour tissue is not as compressible as the surrounding skin. If it is obvious that all of the tumour cannot be removed, the procedure is stopped, and once confirmatory biopsy results are obtained other treatment may be planned.

III. Results of Therapy by Electrodesiccation and Curettage Compared with other Methods

Material and Methods

All new cases of biopsy-proved basal cell carcinomas seen at the Ottawa Civic Hospital Clinic of the Ontario Cancer Foundation from 1955 to 1959 inclusive were included in this survey, except those with inadequate documentation. All recurrences included were proved by biopsy. Patients with these tumours are routinely followed up for three years.

Results

TABLE I.—TREATMENT METHOD AND RESULTS, BASAL CELL CARCINOMA - NEW LESIONS, 1955 - 1959 INCLUSIVE - ALL BIOPSY-PROVED

	Total		*Recurrences*	
	No.	*%*	*No.*	*%*
	390	100.0		
Method				
Electrodesiccation and curettage	287	73.8	22	7.66**
Scalpel excision	63	16.1	6	
X-ray	24	6.2	1	
Miscellaneous radiation*	16	4.0	1	

*Includes cobalt beam, cobalt needles, radium moulds, radon seeds, gold grains.
**See Table II.

TABLE II.—BREAKDOWN OF ELECTRODESICCATION AND CURETTAGE CASES

	Electrodesiccation and curettage cases					
	Total No.			*Recurrences*		
				No.		*%*
	287			22		7.7
Doctor						
A	76			2		2.6
B 61		8			13.1	
C 44	148	5		16	11.4	10.8
D 43		3			7.0	
Others (*6*)	63			4		

Comments on Results

The indications for choice of treatment method are discussed in Part IV.

The 7.7% recurrence rate is reasonably satisfactory. These results are similar to those recently reported by Knox *et al.*[1] We do not believe that accurate comparisons are possible between various methods of treatment—there are too many variables. The authors agree with Epstein,[2] who has stated: "There are those patients who develop epitheliomas (basal cell type) adjacent to treated areas in spite of the method of treatment employed. These patients have an epidermis which produces multicentric foci of epithelioma at a distance from the original lesion and thus continue to form neoplasms regardless of how radical the original treatment may be. There seems to be an irreducible percentage of failure in the treatment of epithelioma which is probably 1 to 2 per cent."

While the number of cases recorded in Table II is small, the implications are obvious. Doctors B, C and D had a recurrence rate of 10.8%; Doctor A had a recurrence rate of 2.6%. Doctor A had a special interest and training in this technique. Doctors B, C and D were resident physicians who had no prior experience. It should also be noted that Dr. A's lower recurrence rate was obtained even though the patients in this group included those with larger and more difficult tumours. A logical conclusion is that if Doctor A had performed all of the treatments the overall recurrence rate would have been lower.

If it takes a highly trained person to treat these tumours by electrodesiccation and curettage, the practicability of this technique may justifiably be questioned. In our opinion the requirements are a modicum of manual dexterity in the use of a curette, knowledge of what a basal cell carcinoma "feels" like, knowledge of the histopathology of basal cell cancers and a certain amount of supervised experience. We do not believe that any of these qualifications should be beyond the capabilities of those who treat skin cancers. It should be mentioned in passing that all of these requirements are fulfilled in resident dermatological training and are part of the armamentarium of most practising dermatologists.

IV. ADVANTAGES AND DISADVANTAGES OF ELECTRODESICCATION AND CURETTAGE AS A METHOD OF TREATMENT

1. *Type of Basal Cell Carcinoma*

The sclerosing type of basal cell carcinoma is the only type for which electrodesiccation and curettage treatment is not indicated. The firm fibrotic tissue cannot be easily distinguished from the surrounding tissue. In such cases we prefer wide excisional surgery, or occasionally the insertion of cobalt-60 needle implants.

The superficial multicentric type where the tumour rarely penetrates more than 1-2 mm. is ideally treated by electrodesiccation and curettage.

It seems to us illogical, as a general rule, to use radiotherapy on the type of basal cell carcinoma which has developed in sun-damaged skin. Because of this solar damage, there is a tendency to form tumours, i.e. a pre-cancerous state. To add another pre-cancerous state (*viz.* radiodermatitis) is not rational therapy. By electrodesiccation and curettage no additional damage is done, and possible re-treatment by any method is not prejudiced.

2. *Number of Basal Cell Carcinomas*

Basal cell carcinomas frequently are multiple (a) in sun-damaged skin, (b) in association with the basal cell nevi syndrome, and (c) with the superficial multicentric type. Radiotherapy is the least desirable method of treatment in such cases. It is the authors' opinion that less scarring is obtained by removing small tumours of the superficial multicentric type of electrodesiccation and curettage than by multiple surgical excisions. The importance of using a sketch outline drawing (Fig. 16) of the face became apparent in our review of these cases. The accurate location so provided is necessary to distinguish between recurrences and new tumours, and in the recording of tumour location such terms as "right cheek" or "behind left ear" without the use of an anatomical chart are not sufficiently specific for this purpose.

THE ONTARIO CANCER TREATMENT AND RESEARCH FOUNDATION

OTTAWA CLINIC

NAME OF PATIENT: _____ CASE NO: _____

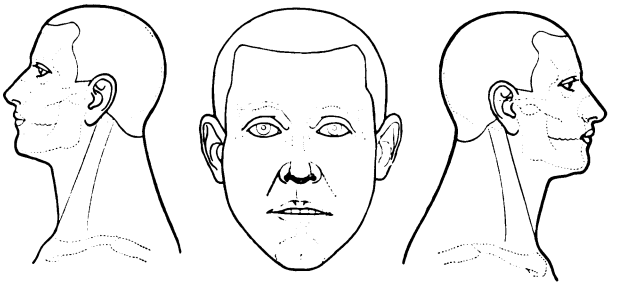

Fig. 16.—Diagrams used to indicate exact location of tumour.

3. *Size of Basal Cell Carcinoma (Fig. 17)*

As a general rule, we consider that lesions up to 2½ cm. in diameter are suitable for this procedure. Much larger ones (up to 5 x 2½ cm.) have been treated successfully by this technique, but these were usually of the superficial multicentric type or there were other very extenuating circumstances. Certainly, small 1-2 cm. sized lesions are frequently treated by electrodesiccation and curettage. Small peripheral recurrences following plastic surgery and radiotherapy can be treated very satisfactorily by this technique. The size of the lesion must be considered in conjunction with its location.

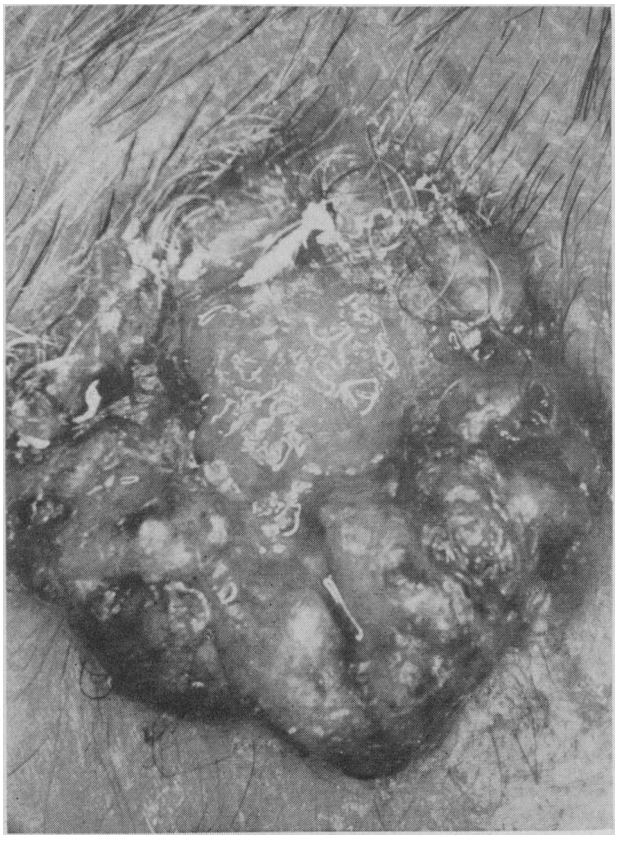

Fig. 17.—Common basal cell carcinoma. A bulky 5-cm. tumour on left pre-auricular area in an 84-year-old woman who was crippled from a stroke. This is not suitable for electrodesiccation and curettage. Radiotherapy fractionated over a period of one month was used.

4. *Location of Basal Cell Carcinoma*

The location of the tumour is a very important factor. On flat areas of skin like the neck, the malar areas or chin, the technique is easily carried out. Lesions in the nasolabial fold have been troublesome at times. Some of these seem to spread deeply, and it may be difficult to distinguish between tumour and the soft sebaceous gland-filled tissues. Other orificial tumours must be treated with respect, although many small eyelid and eyelid-margin lesions have been treated successfully by electrodesiccation and curettage. On the forehead there is frequently deep penetration even with very minor or no ulceration. We have also experienecd difficulty in treating lesions located on the upper lip under the nasal vestibule.

5. *Age and Infirmity*

Another and important advantage of this method of treatment concerns those elderly and/or infirm patients who find it inconvenient or impossible to attend a clinic for fractional x-ray therapy. As indicated above, treatment by electrodesiccation and curettage is completed at one sitting. Single dose, "hot poker" type radiotherapy is mentioned only to be condemned.

6. *Sequelae (Fig. 18)*

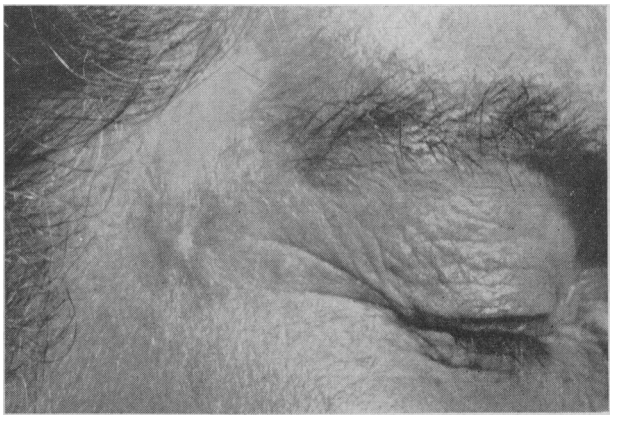

Fig. 18.—Scars from technique of electrodesiccation and curettage on right temple. The upper scar is 5 years old, the lower scar is 2 months old. Note hypertrophic scar in centre of lower lesion with radiating bands. This hypertrophic scar will disappear and should not be confused with recurrent tumour.

Many lesions treated by electrodesiccation and curettage show no discernible scar after 6-12 months. Where scarring is present, it appears as a white atrophic area. Very occasionally (especially in the case of larger lesions) there is some hypertrophic scar formation. True keloidal scars are very rare. The overall cosmetic results are comparable to those of plastic surgery; as a general rule, they are slightly better than those of fractionated radio-

therapy and are much better than those of single-dose radiotherapy.

7. *Economic Factors*

From the patient's point of view and the community's point of view, any reduction in the cost of medical care should be welcomed. The expense involved in radiotherapy, with the frequent visits, medical supervision, paper work, and travelling and living expenses that it entails, is quite high. Even the omission of a visit for removal of sutures would help the aged, the poor and the infirm. Hospitalization at $25.00 a day seems a costly alternative. In properly selected cases, the authors believe that electrodesiccation and curettage is the most economical way to treat basal cell carcinoma.

Electrodesiccation and curettage is not a panacea for the successful treatment of all basal cell carcinomas. Accurate diagnosis with classification of the tumour type is still a prerequisite. Knowledge of the histopathology of the various types is essential for their proper management. As outlined above, the technique must be studied and practised, and in this respect it is similar to any other treatment requiring skill and experience. That failures may occur with this form of treatment is freely admitted, but with experience in selecting appropriate cases the overall cure rate should be about 98%.

Mohs' microscopically controlled chemosurgical technique[7] is probably the definitive method of treating basal cell tumours. Technically, however, it is a most complicated procedure and is probably impractical for general use.

SUMMARY

A study of the results of treatment of 287 basal cell carcinomas by electrodesiccation and curettage indicates that this method can yield a cure rate of 97.4% when it is performed by those experienced in this technique.

Like other techniques, this method has its limitations; unusually large and destructive tumours (fortunately now uncommon) and the sclerosing (morphea-like) lesions are not suitable for this form of therapy.

It is not suggested that electrodesiccation and curettage should be used to the exclusion of such time-proved methods as irradiation or plastic and chemosurgery. Each of these methods has its particular place as well as its limitations.

It is imperative that those who manage skin cancers should have knowledge of the various treatment methods. A team consisting of a radiotherapist, a dermatologist and a surgeon, with the active co-operation of a pathologist, would provide the ideal approach. For problem cases this team approach is essential to give the best possible care to the patient.

A brief working classification of the types of basal cell carcinoma has been given, along with the details of the technique of electrodesiccation and curettage.

We are deeply indebted to Dr. G. T. Stoddart and all of his co-workers for their co-operation. Mr. M. Smith of the Department of Photography of the Ottawa Civic Hospital took many of the clinical photographs and all of the photomicrographs.

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PAGES OUT OF THE PAST: FROM THE JOURNAL OF FIFTY YEARS AGO

INFLAMMATORY CYSTS AND CANCER OF THE BREAST

Evidence, therefore, indicating a relationship between inflammation or irritative processes of tissues, to cancerous conditions, are not wanting either from clinical or microscopical sources. As we have then come to accept these observations and interpretations as facts, we must also be willing to appreciate the difficulties which must arise in those borderland conditions which, having obvious inflammatory or reactive changes, also have some of the characters of early malignancy.

At the present time in the practical crusade against cancer by the surgeon, the early diagnosis of the process is most important. Radical operation is still the important measure of success. It has come, therefore, that the former stereotyped points for clinical diagnosis of cancer are almost valueless in coming to a conclusion whether a tissue has benign or malignant qualities. The most satisfactory evidence, although not always conclusive, is gained by the examination of the tissue after removal, both by macroscopic and microscopic means. Nevertheless this technical procedure must be preceded by the collection of all possible clinical data. The differential diagnosis of any given case must rest in the hands of the clinician, who obtains additional information upon the case from all the allied departments of medicine. In the hope of early diagnosis, every means must be sought to give assistance in the better understanding of the disease process, for we have learned that our hopes in cancer are in the early removal, before the malignant character of the growth has become dominant in diverse parts of the body.

The surgeon has for years been insisting upon the sending of cases with malignant neoplasms to him early, and although much has been done in this direction, we have today reached a point where it is quite impossible to make an early diagnosis by clinical means alone. Small tumorous masses are often observed by the practitioner, but in this early stage even the keenest observer would hesitate to give a conclusive answer to the question of malignancy. Fischer-Defoy points out that our present attitude, gained by the experience of early operation on doubtful cases, is one of intense alertness, weighing in the impartial balance points gleaned in each case. The cases are frequently observed so early that cachexia, anaemia, and wasting may all be absent. Fever, ulceration, and chronic discharging sinuses are only observed in the neglected conditions.—Oskar Klotz, *Canad. Med. Ass. J.*, 2: 377, 1912.