

RADIOTHERAPY IN THE TREATMENT OF KELOIDS IN EAST AFRICA

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SUMMARY

Seventy-nine patients (73 Africans and six Asians) with 138 keloids have been treated at Department of Radiotherapy, Kenyatta National Hospital, Nairobi and followed at least two months after the completion of the treatment.

The treatment has been surgical excision, radiotherapy, surgical excision and postoperative radiotherapy or no treatment.

Excision and postoperative radiotherapy immediately after the operation give the best results. Excision alone, gives extremely poor results. Radiotherapy alone gives objective reduction of the keloid and amelioration of symptoms.

INTRODUCTION

Keloids are particularly common in Africa and because they are often large and invalidizing they present a serious problem of medical care. In East Africa keloids have hitherto been treated surgically and the frequency of recurrence would seem to have been high (Bourel, Resillot, Colomar and Piquard 1). The present study was undertaken with the object of examining the results of treatment of keloids in East Africa by surgery or radiotherapy alone, and by surgery followed by radiotherapy.

Case series

The case series consisted of 142 patients (126 Africans, 11 Asians, five Europeans) treated at the Department of Radiotherapy, Kenyatta National Hospital, Nairobi, between December 1969 and May 1972. All had serious symptoms from the keloids. Seventy-nine of them (73 Africans and six Asians) had been followed up for at least two months after the completion of the treatment; these had a total of 138 keloids. The treatment was as follows:

Surgical excision only	12
Radiotherapy only	17
Surgical excision and postoperative radiotherapy	103
No treatment	6

The follow-up times are given in Table 1.

Radiation therapy was given by an X-ray therapy unit with the constants: 45 and 100 kV energy, 0.55 and 1.70 mm. Al and 10 and 8 mA. The suture and needle holes are included in the treatment field with a margin of 0.5 cm. The total radiation dose varied from 500 to 2400R

given in one to 14 days, so as to be able to obtain a suitable basis for evaluating the results according to dose. For the same reason the time between the operation and the radiotherapy varied from one to 22 days.

Table 1

The follow-up period for the keloid patients

Follow-up period, months	..	2<6	6<12	>12
Number of patients	54	51	33

RESULTS

All six of the keloids in patients not receiving treatment throughout the observation period progressed.

In the patients with the 12 keloids for which the sole treatment consisted in surgical excision there was a recurrence within two months. Of the 103 keloids for which postoperative radiotherapy was given in 82 (80 per cent) there was no recurrence during the follow-up time. The frequency of recurrence in relation to radiation dose is shown in Table 2. Since there may be other factors than the dose that may be of significance, for the effect of the postoperative radiotherapy, an analysis of the 21 failures was made; the results are presented in Table 3.

Excision of keloids alone was almost invariably followed by recurrence (Table 2). Postoperative doses less than 1000 R, and even as low as 500-600 R could prevent recurrence of the keloid but there is a considerable proportion of such recurrences even when the whole dose was given at a single treatment (Table 2). Recurrence after one postoperative treatment with a dose of 1200 R was fairly uncommon; in most cases of recurrence after 1200 R the keloid had been unusually large, or an unusually curved area was irradiated (Tables 2 and 3). Doses of 1400 R and more in all cases in this series prevented recurrence (Table 2).

Radiotherapy alone, given to 17 keloids, resulted in total regression in two cases and a reduction in the keloid, with amelioration of the symptoms, in 14. In one patient the radiotherapy was without effect (Table 4).

Table 2

Frequency of recurrence of keloids according to dose given in R, 1-22 days after excision.

Dose, R/days	No. of keloids	Recurrences	
		No.	Per cent
0	12	12	100
500-600/1	6	2	(33)
800-1000/1	17	9	53
1200/1	53	6	11
1400-1600/1-3	14	0	0
1000-1200/7-14	4	4	(100)
1600-1800/13-14	2	0	—
2000-2400/2-7	7	0	—

Table 3

Analysis of failures with recurrence after postoperative radiotherapy for keloids in East Africa.

<i>Dose, R/days</i>	<i>Interval between excision and radiotherapy, days</i>	<i>Follow-up period months</i>	<i>Comments</i>
500/1	32	13	Low dose, long interval
600/1	5	3	Low dose, long interval
800/1	21	18	Low dose, long interval
800/1	21	18	Low dose, long interval
800/1	10	2	Low dose, long interval
800/1	10	2	Low dose, long interval
800/1	1	6	Low dose
1000/1	1	12	—
1000/1	1	12	—
1000/1	1	3	—
1000/1	1	3	—
1200/1	8	9	Unusually long keloids
1200/1	1	12	Unusually long keloid
1200/1	5	22	Curved area to be treated (jaw)
1200/1	1	9	—
1200/1	1	4	Unusually long keloid (13 cm.)
1200/1	2	2	Unusually long keloids (23x10cm)
1000/8	14	15	Low dose, long interval
1000/8	14	15	Low dose, long interval
1000/8	14	15	Low dose, long interval
1200/14	14	10	Low dose, long interval

Table 4

Effect of radiotherapy, for keloids in East Africa

<i>Dose, R/days</i>	<i>No. of keloids</i>	<i>Follow-up period months</i>	<i>Results</i>
800/1	2	4	Diminished*
800/1	1	3	No effect
1200/1	3	3	Diminished
1200/1	4	10	Diminished
2000/3	1	8	Diminished
2400/2	2	4	Total regress
2400/4	3	2	Diminished
2400/4	1	3	Diminished

* Objective reduction of keloid and amelioration of symptoms.

DISCUSSION

The fact that in cases where surgical excision of the 12 keloids was not followed by radiotherapy there was a recurrence within two months does not of course mean that keloids in Africans cannot be cured by surgery alone. It was, of course, ethically indefensible to withhold radiotherapy for the sole purpose of increasing the number of patients in this admittedly small group. However, those patients had additional 24 keloids treated by excision and postoperative irradiation. Twenty-one of these healed without recurrence.

This form of combined treatment, excision followed by postoperative irradiation, has been recommended by a number of authors as a suitable management of keloids. Van den Brenk and Minty (2) state that between 1000 and 1500 R delivered as a single dose, is necessary for suppression

of keloid recurrence after excision. For none of 25 lesions did Greer and Vickers (3) find recurrence after 1500 to 2000 R, given in fractionated doses after excision. Among the 31 recurrences, 25 lesions had received less than 1200 R. Brown and Bromberg (4) recommend 1500 R; 18 out of 30 patients treated (60 per cent) showed no recurrence. Out of 16 keloids in ten patients Craig and Pearson (5) found that 14 were cured after a single dose of 800 R after surgery. In 74 per cent of their cases King and Salzman (6) were successful with a combination of excision followed by electron-beam therapy delivering 1000 to 3000 R.

None of these series consist of Africans, however; and since keloids obviously tend to occur more commonly among Africans than among Europeans, and the frequency of recurrence after surgery alone is greater, it is impossible to apply to African patients the experience gained from European series.

On the basis of our results we would recommend an excision followed by postoperative radiotherapy, with a dose of 1200 R, except in cases where the keloid is unusually long or the area to be treated is very convex, when a dose of 1400 R would be more suitable.

Van den Brenk and Minty (2) recommend a single dose within 48 hours of surgery. Greer and Vickers (3) divided weekly dose over four to five weeks, the therapy beginning within 24 hours of surgery. Brown and Bromberg (4) recommend treatment over seven to ten days, starting within three weeks of the surgical removal of the keloid, and Craig and Pearson (5) a single dose 48 hours postoperatively. King and Salzman (6) give single-dose electron beam therapy on the same day as surgery.

There would seem to be no reason to fractionate the treatment with the radiation doses that need to be given in postoperative treatment of keloids. The risk of recurrence would appear to increase the longer the interval between the operation and the radiotherapy (Table 3).

CONCLUSIONS

In the treatment of keloids in Africa excision alone gives extremely poor results. Radiotherapy is more effective, but by no means entirely satisfactory; its main virtue lies in objective reduction of keloid and amelioration of symptoms.

Excision and postoperative radiotherapy give the best results. The preferred dose is 1200 R, except in the case of unusually large keloids. There is no reason to fractionate the dose and it is probably best to give the radiotherapy immediately after the operation.

References

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