



Effectiveness of Corticosteroid Tapes and Plasters for Keloids and Hypertrophic Scars

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56.1 Introduction

In Japan, corticosteroid tapes and plasters have long served as a first-line therapy for keloids and hypertrophic scars. Pediatric patients are particularly responsive to this type of treatment. This may reflect the fact that children have thinner skin than adults and the steroids are therefore more easily absorbed. The postoperative application of corticosteroid tapes/plasters also significantly prevents the development of keloids and hypertrophic scars after surgery.

External corticosteroid preparations are classified into five classes on the basis of their vasoconstrictor activity and their clinical effect, namely, Group I (Strongest), Group II (Very strong), Group III (Strong), Group IV (Mild), and Group V (Weak). Steroid tape is available in the following three countries in different preparations. In the UK, the commercially available formulation comprises a fludroxycortide-impregnated tape ($4 \mu\text{g}/\text{cm}^2$) [1]. Fludroxycortide tape is a Group III preparation. The USA has a steroid tape preparation that contains $4 \mu\text{g}/\text{cm}^2$ flurandrenolide, which is also a Group III preparation [2]. In Japan, two steroid tape formulations are available, namely, the Group III preparation found in the UK ($4 \mu\text{g}/\text{cm}^2$ fludroxycortide tape) and a $20 \mu\text{g}/\text{cm}^2$ deprodone propionate tape. Deprodone propionate tape is considered to be a Group I or II preparation [3] (■ Fig. 56.1). In our experience, deprodone propionate tape (Eclar® plaster) is the most effective tape for the treatment and prevention of keloids.

56.2 Difference Between Steroid Tapes/Plasters and Steroid Injection

Corticosteroid injections rapidly reduce the volume of keloids and hypertrophic scars. However, the downsides of corticosteroid injections include pain (caused by the injection itself) and difficulties associated with contraindications such as pregnancy, glaucoma, or Cushing's disease [4]. These problems can be overcome by using steroid tapes/plasters. Most pediatric and older patients can be treated by steroid tapes/plaster alone due to their thinner skin, which means that the steroids are easily absorbed.

Corticosteroid tapes/plasters can also be used in combination with other therapies such as corticosteroid injection. This is particularly suitable for adults with keloids and hypertrophic scars. The patients can apply the steroid tape/plaster every day in their homes and undergo the injection when they can go to the hospital. In our hospital, we succeeded in reduc-



■ Fig. 56.1 The steroid tapes and plasters that are available in Japan. a Fludroxycortide tape (Teikoku Seiyaku CO., LTD., Kagawa, Japan). b Deprodone propionate plaster (Hisamitsu Pharmaceutical CO., LTD., Saga, Japan)

ing the number of hospital visits of patients with pathological scars by adopting this approach. Indeed, many patients now only come to our hospital every 3–4 months.

56.3 Typical Usage of Steroid Tapes/Plasters

Steroid tapes/plasters should be changed every day. Important tips regarding the treatment of keloids and hypertrophic scars with steroid tapes/plasters are as follows. First, the patient should continue to use the tapes/plasters until the elevated mass becomes flat and soft. The patient must also cut the tape according to the shape of the keloid or hypertrophic scar. Second, once

the mass has become flat and soft, the use of steroid tape/plaster should be stopped, even if the scar is still red. This reflects the fact that if the patient continues to use the tape just because the scar is still red, capillarectasia will occur. This is because the steroid treatment thins the structures supporting the blood vessels.

56.4 Difference Between Deprodone Propionate Plaster and Deprodone Propionate Ointment

At this stage, deprodone propionate plaster is the strongest steroid tape/plaster in the world. Deprodone propionate plaster was launched by Hisamitsu Pharmaceutical Co., Ltd., Saga, Japan in July 2001. Since the deprodone propionate in this plaster is at a concentration of $20 \mu\text{g}/\text{cm}^2$, each $7.5 \text{ cm} \times 10 \text{ cm}$ sheet contains $1500 \mu\text{g}$ of the steroid. The product sheet states that of the 910 cases, 24 (2.64%) exhibited side effects to this plaster. The main side effects were capillary dilation (nine cases, 0.99%), contact dermatitis (five cases, 0.55%), skin atrophy (four cases, 0.44%), and hair folliculitis (four cases, 0.44%).

Deprodone propionate ointment is considered to be a Group III preparation: thus, it is 1–2 ranks weaker than deprodone propionate tape. This is because of differences in the action time and how much steroid is absorbed. When choosing between deprodone propionate ointment or deprodone propionate plaster, it should be noted that to cover the 75 cm^2 area of one deprodone propionate plaster, one must apply 0.125 g of deprodone propionate ointment. This is because the product sheet states that 0.5 g of the ointment can coat an area of 300 cm^2 . However, since the ointment consists of 0.3% of the active ingredient, 0.125 g of ointment will only contain $375 \mu\text{g}$ of deprodone propionate. This is one-quarter of the amount of one tape

($1500 \mu\text{g}$). Therefore, deprodone propionate ointment will only have the same effect as 24-hr/day deprodone propionate plaster if the ointment is applied to the affected area 4 times a day and is covered with an occlusive dressing technique (ODT) using, for example, a polyurethane film.

56.5 Therapeutic Effect and Usage of Steroid Tape Preparations

In adults, deprodone propionate plaster is a more effective therapy for pathological scars than other steroid tapes. However, in pediatric patients, the therapeutic effect of the other tapes is sufficient (■ Fig. 56.2). This is indicated by our observational study [3] on the use of fludrocortide tape in 30 adults and 30 pediatric patients with hypertrophic and keloid scars. The adults were, on average, 37 years old (range 23–67 years), while the pediatric patients were, on average, 7.2 years old (range 2–15 years). Each patient had one scar that was treated with the tape. The scars were on various body sites, including the trunk and extremities. The scars were over 1 year old and the tape was used for at least 1 year for 24 hr/day. The results after 1 year of treatment were judged by using the Japan Scar Workshop Scar Scale 2015 (JSS) [5]. The results suggest that the fludrocortide tape improved the scars of 20% of the adult patients and 80% of the pediatric patients. After 1 year of fludrocortide tape usage, the 24 unresponsive adults were switched to 24 hr/day deprodone propionate plaster treatment. Of these 24 cases, 17 (70.8%) exhibited scar improvements 1 year later. Thus, we conclude that adults require a stronger tape to obtain similar responses as children in terms of scar maturation. Thus, deprodone propionate plaster is better for adults, while fludrocortide tape is sufficient



■ Fig. 56.2 Effect of fludrocortide tape on a scapular keloid of a 9-year-old boy. **a** Before treatment commenced. **b** Sixteen months after starting treatment. **c** Twenty-six months after starting treatment

Fig. 56.3 Effect of deprodone propionate plaster on an upper arm keloid of a 25-year-old female patient. **a** Before treatment commenced. **b** Twelve months after starting treatment



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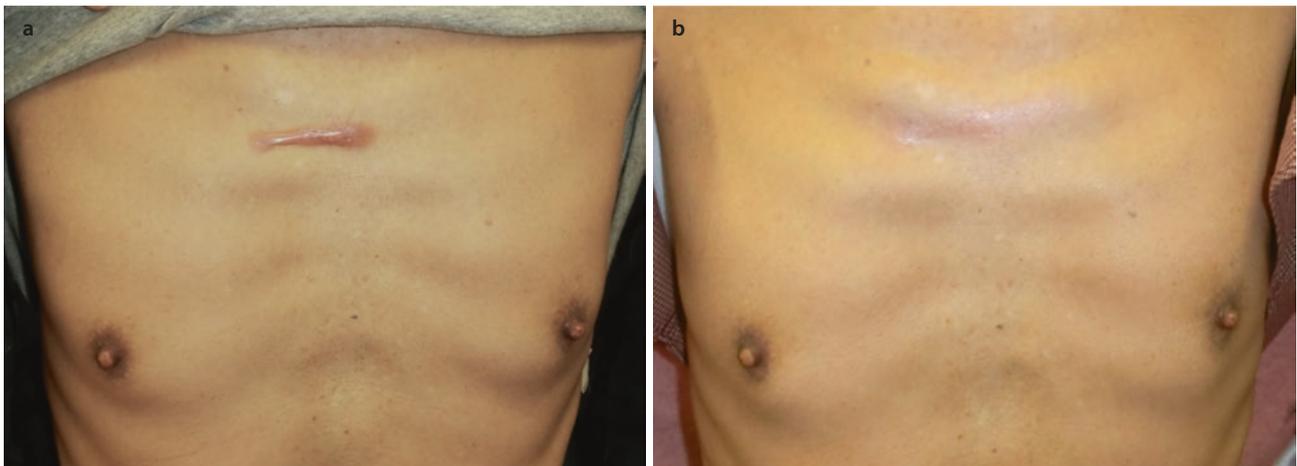


Fig. 56.4 Effect of deprodone propionate plaster on an anterior chest wall keloid of a 68-year-old male patient. **a** Before treatment commenced. **b** Twelve months after starting treatment

for pediatric patients (■ Figs. 56.3, 56.4, and 56.5). The side effects in our study consisted of contact dermatitis in three adults. None of the children exhibited any side effects.

Steroid tapes/plasters can also be used to prevent recurrence after keloid and hypertrophic scar resection (■ Fig. 56.6). My empirical experience is that starting 24 hr/day deprodone propionate plaster treatment

1 month after surgery appears to suppress recurrence. Further research is needed to test this hypothesis. It should be noted that we currently routinely use deprodone propionate tape combined with radiotherapy as a postoperative adjunct in surgically treated keloid cases to reduce the recurrence rate. In our experience, this combination reduces the postoperative keloid recurrence rate to less than 10% [6].

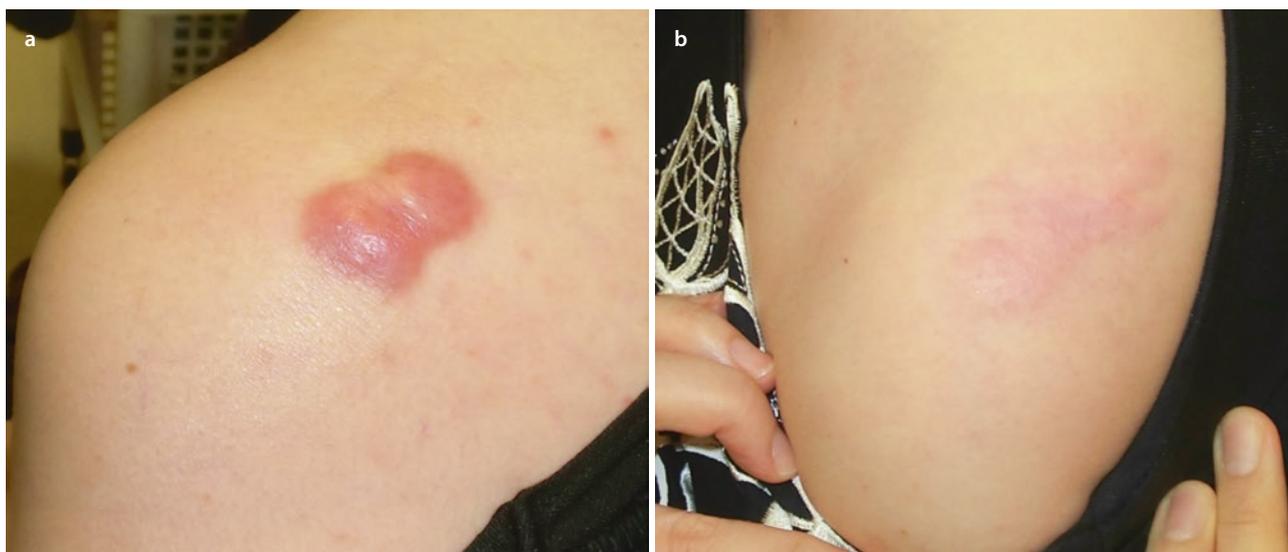


Fig. 56.5 Effect of deprodone propionate plaster on a shoulder keloid of a 49-year-old female patient. **a** Before treatment commenced. **b** Thirty-six months after starting treatment



Fig. 56.6 Effect of surgery and postoperative deprodone propionate plaster treatment on a shoulder keloid of a 9-year-old boy. **a** Before treatment commenced. **b** Intraoperative view. **c** View immediately after surgery. **d** Twenty months after surgery. **e** Thirty-six months after surgery

diately after surgery. **d** Twenty months after surgery. **e** Thirty-six months after surgery

56.6 Side Effects of Steroid Tapes and Plasters

Contact dermatitis is the most common problem associated with the use of steroid tapes/plasters. According to the product sheets, the frequencies of contact dermatitis during fludrocortide tape and deprodone propionate plaster treatment are 16.7% and 0.55%, respectively. This is consistent with our impression in clinical prac-

tice. Thus, deprodone propionate plaster associates with a lower incidence of contact dermatitis. There are two types of contact dermatitis, namely, irritant contact dermatitis and allergic contact dermatitis. One can reduce the possibility of the former by decreasing the frequency with which the tape/plaster is replaced and by reducing the duration of application. Thus, the risk of irritant contact dermatitis may be decreased by various strategies, including replacing the tape/plaster every

24–48 hours, only wearing the tape/plaster overnight, or applying the tape/plaster for 1 day and then using ointment on the next day. In the case of deprodone propionate plaster, we have the impression that mild contact dermatitis is suppressed by the effect of steroid itself. If, however, allergic contact dermatitis develops, it often arises 1–3 months after the start of use. Since it can produce strong pruritus and reddens the skin, it can hamper the continuous use of the tape.

Take Home Messages

- In Japan, corticosteroid tapes and plasters have long served as a first-line therapy for keloids and hypertrophic scars.
- Pediatric patients are particularly responsive to this type of treatment, because children have thinner skin than adults and the steroids are therefore more easily absorbed.
- The postoperative application of corticosteroid tapes/plasters also significantly prevents the development of keloids and hypertrophic scars after surgery.
- Deprodone propionate tape is the most effective tape for the treatment and prevention of keloids.

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