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Comparison of efficacy between blind and direct vision flap trimming for the treatment of axillary osmidrosis.

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Abstract

Objective: To investigate the clinical effect of flap trimming operation under direct vision and blindness in the treatment of axillary osmidrosis.

Methods: One hundred cases (200 sides) of patients with bilateral osmidrosis axillae outpatients who came to our hospital during Sep 2012 to Dec 2015 were selected in this study. Among the patients, 50 cases were treated under direct vision. One or two incisions about 3-4 cm were performed in each side, flaps were separated to the border of armpit hair in superficial fascia layer and turned over, the secreting part of apocrine sweat glands were trimmed completely under direct vision. The other 50 cases were treated under blindness. Incisions were less than 1 cm, flaps were separated beyond the border of armpit hair 0.5 cm in superficial fascia layer, the secreting part of apocrine sweat glands were trimmed or secretion and catheter part were cut under blindness.

Results: In direct vision group, 49 cases were cured and 5 cases (8 sides) had complications. In blindness group, 47 cases were cured and 6 cases (6 sides) had complications. Two groups of data were analysed by chi square test and there were no statistical differences between them (P>0.05).

Conclusion: Both techniques are effective, physicians can choose any operation according to his experience and the patient's specific situation.

Keywords: Osmidrosis, Operation, Flap trimming.

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Introduction

Given the cure rates and effective rates of flap trimming which are higher than other methods in the minimally invasive surgical treatment of axillary osmidrosis, we have mainly adopted flap trimming in the surgical treatment of axillary osmidrosis in the last decade [1,2]. Compared with traditional surgical therapies, axillary flap trimming is conventionally considered as one of the minimally invasive surgical therapies of axillary osmidrosis in the academic field. In clinical practice, some physicians believe that flap trimming operation under direct vision can remove axillary apocrine sweat glands completely and intuitively with a high cure rate and good surgical outcomes. Other doctors believe that flap trimming operation under blindness can remove or destroy axillary apocrine sweat glands, with the same curative effects on axillary osmidrosis and the skin incision less than 1 cm. Compared to flap trimming operation under direct vision in which the skin incision is 3-4 cm, the incision in flap trimming operation under blindness is smaller. Therefore, flap trimming operation under blindness is closer to the minimally invasive concept. In this paper, we randomly selected the clinical data of 100 patients with axillary osmidrosis treated in our hospital from May 2012-2013 in order to perform a comparative analysis of the treatment effects of flap trimming operation under direct vision and blindness. Among these patients, 50 patients received flap trimming operation under direct vision while the rest received flap trimming operation under blindness.

Materials and Methods

General information

A total of 100 outpatients with bilateral axillary osmidrosis including 58 males and 42 females aged 14-46 y old, were included in the study during Sep 2012 to Dec 2015. All patients received the surgery by both sides of armpit. Informed consents were obtained from all patients included. Patients who did not sign the informed consent and who had severe cardiovascular or renal complications that are not suitable for surgery were excluded. Among the patients, 23 cases had received laser therapy and 68 cases had received drug treatment before but the efficiency was not well. In this study, fifty patients (28 males and 22 females) received flap trimming operation under direct vision while the rest (19 males and 31 females) received flap trimming operation under blindness. Follow-up were recorded in 6 months after operation. The study was approved by the Ethic committee of the First People's Hospital of Jining.

Surgical methods

Flap trimming operation under direct vision: Preoperative preparation: upper limbs of the patient in the supine position were outreached for routine skin preparation. Markers were used to mark the extent of surgery along boundaries of armpit hairs. For patients who had rare armpit hairs, the extent of surgery was marked at the junction of wet and dry skins by the finger test. Based on the size of the surgery area, 1-2 incision lines which could facilitate operation within the whole surgery area were designed along the direction of folds in armpits. The length of the incision lines were 3-4 cm, which made full flipping of flaps possible in the surgery.

Local anaesthetic drug preparation: 2% lidocaine 15 ml +normal saline solution 80 ml+adrenaline 0.3 mg+5% sodium bicarbonate 2 ml (the concentration of lidocaine: 0.3%).

Surgical procedures: Bilateral surgeries were performed simultaneously. Based on the range of surgery area, local anaesthetic 30 ml to 50 ml of drugs were injected into both sides. Full-thickness skins were cut along the incision line until superficial facial layer could be seen. Sharp and blunt separation of flaps was performed using ophthalmic scissors on the superficial facial layer. Flaps within the entire incision line were raised. After flipping flaps, pink granular apocrine sweat glands could be seen in subdermal superficial fat tissues. The distribution of apocrine sweat glands was dense in the center of subdermal superficial fat tissues, while the distribution was gradually rare at the margin which disappeared in the edge of armpit hairs. Normal adipose tissues could be seen in edge of armpit hairs. The entire flap was trimmed under direct vision. Apocrine sweat glands attached to apocrine sweat glands were trimmed and removed completely, while the subdermal vascular network was retained consciously. Normal saline flushed separated lacunae to remove the remaining tissue fragments. Lacunae were checked to make sure that there was no active bleeding. Incisions including a small amount of base tissues were sutured using 5-0 Mersilk at a small interval. Incisions were coated with erythromycin ointment. 3-4 about 5 mm long drainage port were poked on the flap. In the surgery area edge, 3 groups of baling lines were sutured using 3-0 Mersilk. 3-5 layers of 75% ethanol wet gauzes covered the surgery area. A pile of sterile dry gauzes were used outside. Dressings were packed and pressured. Self-adhesive bandage which was bandaged and pressured appropriately was used outside the dressing.

Flap trimming operation under blindness: Markers were used to mark the extent of surgery along 0.5 cm outside the armpit hairs. The design principles of incision and the preparation of local anaesthetic drugs were identical to those in flap trimming operation under direct vision, except that the length of incisions was shortened to 1 cm which could accommodate ophthalmic scissors for operation under blindness. Surgical procedure: full-thickness skins were cut along the incision lines. Sharp separation of flaps was performed using ophthalmic scissors until all flaps within the entire range of line were raised. Assisted by one hand on the skin surface, the other hand held ophthalmic scissors close to the deep dermis to trim flaps, without blind area left, during which flaps were rubbed using thumb and forefinger in order to examine the trimming effects. The expected trimming effects were reached when there were no granular subcutaneous tissues which were similar to full-thickness skin left on the entire flap. Subsequent treatment was identical to that of flap trimming under direct vision.

Postoperative treatment: Patients were hospitalized for observation for three days. During the in-hospital observation period, patients were given conventional hematischesis processing and analgesic treatment without antibiotics. Patients were asked to maintain a good baking of bilateral shoulder joints. Dressings were changed and axillary packaged dressings were replaced with conventional dressings 3 d after operation. Patients were asked to avoid over activities of bilateral shoulder joints. Stitches were removed 2 weeks later. Normal activities of bilateral shoulder joints could be performed 1 month after operation.

During the in-hospital observation period, it was noticed whether or not the outer dressings were damp with blood. If the outer dressings were damp with blood, this indicated that bleeding occurred in the surgery area. Then the surgery area was checked in order to find the bleeding points, and effective measures to stop bleeding were taken, followed by dressings in the surgery area. When the dressing was changed for the first time, hematoma under flaps should be removed before pressure dressing.

The assessment of axillary odour was conducted according to method described by Sung et al. [3]. When the patient and the two dermatologists positioned within 0.5 m were unaware of malodour, it was considered to be cured. Relapse was defined as the odour significantly decreased after surgery, but the patient had a problem with it within 6 months after surgery and received the doctor's recommendation to undergo surgery again.

Surgical results under direct vision and blindness are showed in Table 1.

Table 1. Surgical results under direct vision and blindness.

Surgical method	Case	Sides	Cured cases (sides)	Complication (Sides)						
				Relapse	Delayed wound healing	Bleeding	Hematoma	Flap necrosis	Infection	Total cases

Under direct vision	50	100	99 (99%)	1 (1%)	3 (3%)	4* (4%)	0*	0	0	8 (8%)
Under blindness	50	100	97 (97%)	3 (3%)	1 (1%)	0	2 (2%)	0	0	6 (6%)

Note: Comparison of complications of flap trimming under direct vision and blindness; chi-square=0.307, P=0.579. *P<0.05, compared with the blind group.

Statistical analysis

All calculation in this study was conducted using SPSS 18.0. Two groups of data were examined by the X^2 test or Fisher exact test. A P value more than 0.05 was considered as statistically insignificant.

Results

Therapeutic effects

In group of flap trimming operation under direct vision, a total of 49 cases were successfully cured, and 1 case relapsed (unilateral). The cure rate of direct vision group was higher than the blind group (47 cases with 97 sides cured), however the difference was not significant, P>0.05. The relapsed rate was also lower in group of direct vision (2%) compared with the blind group (6%), however the difference was not significant, P>0.05. There were 3 cases in which wound healing delayed (delayed wound healing occurred bilaterally in 1 case, and unilaterally in the other case), and bilateral bleeding occurred in 2 cases, both higher than those of blind group. However only difference of bleeding was significant between the two groups, P<0.05. There was no case in which a small hematoma (significantly lower than the blind group, P<0.05), flap necrosis or infection occurred. The cure rate was up to 99%, and the complication rate was 8%.

In group of flap trimming operation under blindness, a total of 47 cases were successfully cured, and 3 cases relapsed (unilateral). There was 1 case in which unilateral wound healing delayed. There is no case in which bleeding occurred. There were 2 cases in which a small hematoma occurred unilaterally. There was no case in which flap necrosis or infection occurred. The cure rate was up to 97% and the complication rate was 6%.

Discussion

Due to high cure rate and fewer postoperative complications, flap trimming method was widely adopted for treatment of axillary osmidrosis in China [4,5]. Compared with traditional methods such as laser therapy and drug treatment, it was reported that trimming method had better efficiency [6,7]. However, studies and reports of trimming method in treatment of axillary osmidrosis are not much. In the present study, we investigated efficiency and safety of flap trimming method in treatment of axillary osmidrosis by comparing surgery outcomes between direct and blind groups.

Results showed that, in both groups the cure rate was at a high level and the complication rate was low. A total of four recurrence cases happened in this sample (4 sides), among them 3 cases (3 side) of blindness flap trimming surgical procedures. Reoperation was implemented 6 months after recurrence in 4 cases, all used surgical direct vision flap trimming. The intraoperative findings are in all recurrence cases that there were residual small pieces of apocrine sweat glands section not cleared or destroyed. After the apocrine sweat glands remaining portion was removed, patients in recurrent cases were cured. It indicates no matter which type of flap trimming surgery is adopted, under direct vision or blindness, the key to the cure of underarm odour is complete removal or destruction of apocrine sweat glands. Because using flap trimming surgery under direct vision we can directly observe the top secretion of sweat glands distribution, it is in favour of completely clearance of apocrine sweat glands comparing with blindness flap trimming. The author observed by direct vision flap trimming surgery, apocrine sweat glands basically end at the armpit edge. According to this finding, when implementing the flap trimming surgery under direct vision, one could first free the flap to the armpit edge and turn the flap over, and then locate the end position of apocrine sweat glands under direct vision. Trimming and cleaning the miliary apocrine sweat glands unit could avoid excessive separation of the flap, reducing tissue damage. Under the blindness flap trimming surgery, since the end position of apocrine sweat glands cannot been seen directly, the scope of flap separation should be appropriately expanded to 0.5 cm outside of armpit reach, in order to ensure complete removal or destruction of apocrine sweat glands.

There are some related studies reported by others. He et al. reported restored growth of sheared hair follicles and sweat glands in subcutaneous tissue in 2 to 3 months after surgery [8]. We haven't found this phenomenon in nearly ten decades of postoperative follow-up. We will continue observation. Ding et al. studied two different subdermal trimming techniques for the treatment of axillary osmidrosis and found that incision of 4-5 cm could give better cure rate, however the 2 methods were both under direct vision [9]. Wang et al. reported a minimally invasive procedure for axillary osmidrosis with good efficiency [10]. Complications of this method were not reported much. There are two cases of haemorrhage patients within the group of flap trimming surgery under direct vision, both male and both bilateral haemorrhage. The common features are large disease range and larger surgical trauma. One patient left the hospital spontaneously after surgery with poor surgical braking and returned to the hospital in the midnight after haemorrhage. Another patient was worried that the

painkillers would impact the wound healing and refused to analgesic therapy. At night the surgical pain caused anxiety, irritability and high blood pressure (160/100 mmHg). In addition to above factors, we consider whether direct vision flap trimming has relatively deeper separating position than blindness flap trimming, enlarging perforator vessels larger diameter is also a reason of haemorrhage. Both patients started bleeding in the first postoperative night. After surgical exploration, active bleeding was found. By giving timely disposal, it did not appear flap necrosis or infection. One case had normal postoperative recovery and another example appeared delayed wound healing. Underarm odour postoperative bleeding occurs usually in the early stage may be due to a variety of factors. Hospitalize patients for observation of two days, routinely give to stop bleeding and pain treatment, combine with rehabilitation mission guidance, could stabilize the patient emotions and maintain good shoulder braking state, which is conducive to normal operation recovery. Once bleeding and other accidents occur, timely disposal could avoid adverse consequences.

In the blindness flap trimming surgery group, the incidence of delayed wound healing is lower and the appearance after recovery is superior compared with direct vision flap trimming surgery group. This is related to short skin incision, light wound. Blindness flap trimming surgery is suitable for patients with less extent of underarm odour or young female patients, to ensure treatment of underarm odour and also take into account of patients' appearance requirements. Both cases had no flap necrosis and infection.

Removal and destruction of axillary apocrine sweat glands is theoretical basis to the treatment of underarm odour. The under direct vision axillary flap technique trim we carry out is completely trimming and removal of the axillary apocrine sweat glands secrete unit under direct vision; while blindness axillary trim flap surgery is to cut off the axillary apocrine sweat glands and the duct section portion, to completely destroy the axillary apocrine sweat glands. The 100 cases of surgical cases in this article were operated by different doctors. It may affect the accuracy of statistical data; however treatment results show, both procedures could to achieve the purpose of cure for underarm odour. We used to conduct pathological examination of axillary skin and subcutaneous tissue for patients for 1 year after the cure of underarm odour. We observed remained apocrine sweat glands units with catheter cut-off were remained in the superficial subcutaneous adipose tissue, but there was no smell. Clinical cure surgical results of underarm odour patients were not affected [11]. According to own surgical experience and patients specific circumstances, surgeons can choose between axilla flap trimming surgery under direct vision or blindness to treat underarm odour. Note the details of the treatment after surgery to improve the cure rate and reduce the incidence of complications.

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