Soft Tissue Shavers in Extraction of Lipomas

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Lipomas are common tumors which are usually managed in out-patient departments. Extraction of large lipomas by means of conventional elliptical excision frequently results in long linear scars which are not aesthetically pleasing. Liposuction has been used in the extraction of large lipomas to minimize scarring, and the endoscope has been used in this procedure to avoid complications during surgery. From July 2000 to October 2002, six patients with large lipomas underwent the soft tissue shaving procedure in our hospital. The endoscope was also used to confirm the total removal of lipomas and help check bleeding. The lipomas were located on the posterior portion of the neck, back, and shoulder. No recurrence was noted during follow-up. Skin contour was smooth after the operation, and no dimpling or firmness of the skin were found. The scars were either minimal or scarcely visible, and all of our patients were satisfied with the cosmetic results. (J Plast Surg Asso R.O.C. 2003;12:106 ~113)

Key words: shaver, lipoma

Introduction

The majority of soft tissue tumors are benign. Lipomas, common mesenchymal tumors, usually appear in the form of a solitary, encapsulated mass, and account for one- fourth of all soft tissue tumors.[1] Benign fatty tumors can be divided into three groups: solitary lipoma, familial multiple lipomatosis, and congenital diffuse lipomatosis.[2] Lipomas are usually located on the trunk, posterior portion of the neck, the buttocks and thighs. They often exceed 10 cm in diameter when they are on the back. The diagnosis for lipomas is based on palpation of the mass as well as signs and symptoms. Malignant potential, which is usually suspected in rapid growth tumors and skin ulceration, is rare.[3] Size and location of the lipomas must be taken into consideration if an operation is decided upon. The conventional method involves an elliptical incision through the skin and subcutaneous fat, squeezing or elevation of the tumor, and closing the wound with a long linear suture. Although this procedure has the advantage of rapid and easy removal of the lipomas, the large linear scar results in an unsatisfactory cosmetic appearance, and the aesthetic

results of excising large lipomas in exposed regions are poor. Recently, liposuction has been utilized in extraction of large lipomas to minimize scarring.[4] Sometimes however, the lesion is incompletely removed when using this technique, due to blind extraction. Maintaining hemostasis is another difficult problem, despite the use of epinephrine-containing lidocaine injection during the operation. In some studies, the endoscope has been added to this procedure to solve these problems.[2] The technique has resulted in smaller scar and satisfactory cosmetic effects. Small remote incision with gynecological polyp forceps has also been reported.[5] The incision is made some distance from the lipoma, so that it becomes difficult to approach the mass, and may results in complications such as nerve damage and excessive bleeding.[6] Furthermore, this method has only been applied to median- sized lipomas. For the last two years, our surgeons have used soft tissue shavers for extraction of large lipomas. This study evaluates the efficacy of this procedure.

Materials

From July 2000 to October 2002, six patients with large lipomas (more than 10 cm in diameter) underwent tumor extraction with soft tissue shavers. Two men and four women were chosen. The patients ranged in age from 37 to 54 years old (mean age: 46.5 y/o). The location of lipomas was as follows: three on the back, two on the posterior portion of the neck, and one on the left shoulder. The follow-up period ranged from 6 to 14 months. Detailed data is listed in Table 1.

Table 1. Patients details

Case	Age*	Sex	Size (cm^2)	Operation time**	Location of lipoma
Case 1	46	F	10×12	126	back
Case 2	37	F	12×9	145	posterior portion of neck
Case 3	48	F	10×7	101	back
Case 4	43	M	8×11	148	left shoulder
Case 5	51	M	10×10	125	posterior portion of neck
Case 6	54	F	12×8	106	back

* years old ** minutes

Surgical Procedure

The Linvatec system (Largo, FL) of soft tissue shavers (Fig. 1) was prepared before the operation. The 3-mm inner tube of a side-cutting blade was put in a 4-mm disposable outer cannula and fitted into the handpiece. An infusion pump with normal saline was connected to the handpiece for suction-irrigation during the procedure. Suction tubing was attached and continuous suction was applied. A collection sock was placed in the suction canister to collect the lipoma

fragments and fluid. The shaver console was set at 3000 rpm, and the oscillating mode was selected for our procedure. All of our patients were given general anesthesia. The margin of the lipoma was marked in advance under direct vision and palpation. A 1 cm incision line was made near the margin of the tumor and extended into the subcutaneous fat. The capsule of the lipoma was identified and incised. And the blunt head of the cannula was advanced into the mass through the incision line. Intra-capsular extraction of lipomas with back-and-forth movements of the handpiece continued over the entire mass to shave the fatty tissue. Pieces of the lipoma were then sucked out and collected. As the lump gradually diminished, we used the other hand to guide the shaver and assess the thickness of the subcutaneous fat between the skin and the cannula, to avoid shaving the normal tissue. When the skin contour of the lipoma was nearly flat, a 4-mm, 30-degree endoscope was inserted into the cavity through the incision line to confirm the total removal of the lipoma. The capsule of the lipoma was inspected under endoscope. If necessary, the shaver was again inserted to remove any residual lipoma tissues. The capsule of the lipoma was not removed in our procedure. Bleeding was also checked under endoscopic monitoring, and electro-coagulation was used to maintain hemostasis. All specimens were routinely sent for pathological examination to confirm the benignity of the tumor. After the lipoma was completely removed, a negative-pressure drain tube (e.g., Jackson- Pratt tube) was placed in the lesion to prevent hematoma. Bulky compressive dressing was also applied for one day after the operation. The patients were discharged later on the same day or on the following day after the operation.

Results

Six patients underwent this procedure. Mean operation time was 125 minutes. The follow-up period ranged from 6 to 17 months (mean follow-up period: 11 months). All lesions were successfully removed. There was no incidence of recurrence in any of our cases. The sites of lipoma extraction remained smooth in contour, and the skin color of the lesion did not change after the operation. Also, firmness or dimpling over the lesion was not detected during the follow-up period. The scar was minimal, and all of our patients were satisfied with the aesthetic results of this procedure.

Case 1

A 46-year-old female was referred to our hospital because of a large mass on the left portion of the back (Fig. 2). The mass had grown to its present size over a 6 year period. The patient complained of the unpleasing appearance of the mass. Upon examination, a 10×12 cm^2 soft mass was noted. Lipomas was diagnosed, and surgery was performed under general anesthesia. The surface of the left portion of the patient's back was smooth after operation, and there was no numbness or hematoma. No recurrence was noted during the 17 month follow-up period. The scar on the back was barely noticeable, and the patient was satisfied with the cosmetic results.

Case 2

The patient was a 37-year-old female. She had noticed a mass on the posterior portion of her neck for several years. The mass gradually enlarged and caused pain. Difficulties in finding suitable clothing had also disturbed her for a long time. Despite this, the fear of having an operative scar

made her postpone seeking treatment. Initial examination revealed a soft, elastic mass measuring 12×9 cm^2. CT scan revealed a well- defined, capsulated, subcutaneous tumor. Imaging technology showed the contents of the mass to be of low density, and subcutaneous lipoma was diagnosed. After discussion with the patient, shavers extraction technique was decided on. During a 10 month follow-up period, there was no recurrence on the posterior portion of neck. Sensation and motion of neck are normal, and no pigmentation or dimpling has been found. The scar is not visible, and the patient is satisfied with the cosmetic result.

Fig. 1 (a)

Fig. 1 (b)

Fig. 1 (c)

Fig. 1 Components of soft tissue shaver
(a) power unit (b) Infusion pump (c) Cannula tip

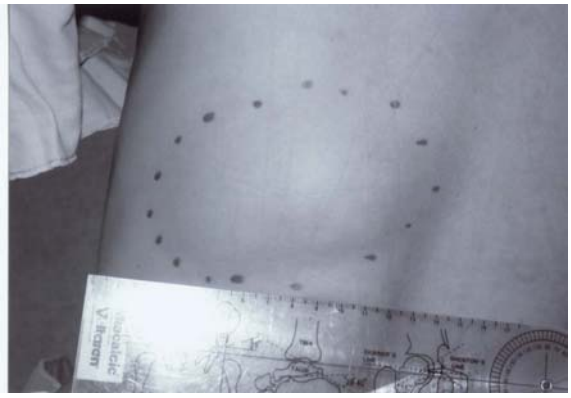

Fig. 2 (a)

Fig. 2 (b)

Fig. 2 (c)

Fig. 2 (d)

Fig. 2 (a) A lipoma measuring 10x12 cm² on the back.
(b) Cannula of shaver in lipoma.
(c) Total remoral of lipoma tissues inside the capsule under endoscope monitoring.
(d) Smooth contour of lesian after operation.

Discussion

Lipomas are common tumors which are usually encountered in the outpatient clinic. Most lipomas are several centimeters in diameter, although a few gigantic lipomas have been reported.[7] The symptoms of lipomas vary. They are usually caused by their proximity to other structures, e.g., nerves. Some cases with large lipomas have the complaints of unsatisfactory appearance in the location of the lesions, and suffering from social pressure, especially when the lipomas are located in exposed regions. Size and location of the lesions are taken into the surgeons' consideration when patients decide to accept an operation. Conventional operative technique for lipoma excision is elliptical incision and total removal of mass. This procedure is suitable in most cases of small to median sized lipomas, and it is simple,

rapid, and requires less skill. For a large lipomas, however, the procedure usually causes a long linear scar which is distinct and ugly. To achieve good cosmetic results, liposuction has been developed in the extraction of lipomas. Liposuction cannula tips are currently designed with blunt edges. Fat is avulsed by back-and forth movements of the aspiration cannula, after which it is drawn into the cannula lumen by the vacuum.[8] The fat is removed through a minimal incision line in a closed system. Though it has the advantages of minimal scarring and good aesthetic results, incomplete removal of lipomas without direct visualization has been mentioned.[2,6] Surgical endoscope was added to this procedure in an attempt to improve the permanency of lipoma removal. With the help of the endoscope, large lipomas can be extracted completely and safely. However, some complications of liposuction include rippling and dimpling, contour excesses and depressions, skin discoloration and scar tissue, and asymmetry and distortion.[8]

In developing an alternative technique to remove lipomas effectively, we have used a shaver in large lipoma extraction for two years. The shaver was originally designed for arthroplastic joint surgery, and later used in temporo-mandibular joint surgery.[9,10] It is a powered shaving device with continuous suction which can remove soft tissue layer by layer. The shaver consists of a handpiece and double-layer cannula tip, including an inner tube of side cutting blade and an outer disposable cannula with a blunt head. The blade is straight-edged or serrated, and can oscillate or can rotate in forward or reverse. The motion of the blade removes the soft tissue with great precision when compared with the basic avulsion principle of liposuction.[8] The mechanical mode of the shaver in removing subcutaneous fat also causes less bleeding during the procedure than liposuction.[11] The blunt head of the shaver can also prevent from direct injuries to vessels and nerves. The blade can rotate clockwise or counterclockwise, or it can be oscillated. The oscillation mode yields better cutting and faster removal of soft tissue than does rotation, and minimizes pulling.[12] The choice of oscillating speed depends on the surgeons' habits. The extracted fatty tissue is sucked out by continuous vacuum. Advantages of this procedure include minimal trauma to normal tissue and the ability to remove fat in an open fashion without high pressures or the need for a closed system.[8] In comparison with conventional liposuction, it is less traumatic for the reasons of lower suction pressure and controlled extraction. In addition, the shaver avoids the swelling that accompanies hydro-dissection with the wet tumescent technique.[13]

Endoscope monitoring is also used in our procedure to confirm the absence of residual tumor and check bleeding. The endoscope is magnified image ensures the through excision of delicate residual tumor. In the open system of shaver technique, the endoscope can be incorporated with electro-coagulation to provide good hemostasis without relying on the vacuum seal. Notwithstanding hemostasis during the operation, a Jackson- Pratt drain tube is inserted into the cavity to prevent hematoma. In our experiences, anchoring sutures were not needed to reduce dead space of the cavity. Though endoscope– assisted shaving procedures have the advantages of minimal scarring and controlled extraction, it still has some limitations and disadvantages. The experience necessary for surgeons to employ endoscope procedures

makes the operation somewhat complicated. Also, errors in evaluating the thickness of subcutaneous fatty tissue during the operation sometimes causes novice operators to overshave. A learning curve of eye-hand coordination is required with this technique. Mean operation time was 125 minutes in our experiences. It is much longer than that of conventional method. Furthermore, because the shaver device is a mechanism for cutting soft tissue, one cannot avoid causing a certain amount of damage to nerves or blood vessels. Consequently, this technique is not suitable for lipomas neighboring neurovascular bundle regions (e.g., the axilla). The need for special instruments also limits the application of this technique.

Conclusion

The endoscope-assisted shaving procedure provides the advantages of minimal scarring and good aesthetic results when compared with conventional open excision for large lipomas. The controlled extraction and visualization under endoscope monitoring also ensure the total removal of lipomas and achieves good hemostasis. In our experiences, patients' satisfaction with cosmetic results has been high.

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軟組織刮除術在脂肪瘤之應用

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脂肪瘤是在門診經常可遇到且可以處理的腫瘤，較大的脂肪瘤以傳統切除術處理常會在外觀上留下長及較明顯的疤痕。近來抽脂術已被應用在大脂肪瘤的切除以維持外觀的完整性並縮小殘存的疤痕，內視鏡也被使用於此方法以減少術後出血及其他可能的併發症。從 2000 年 7 月至 2002 年 10 月，我們以軟組織刮除術處理 6 個患有大脂肪瘤的病人，我們亦同時使用內視鏡檢視術後的出血及確認腫瘤的完全切除，腫瘤的位置有位於後頸部、背部及肩部者，病患在術後的追蹤期間並無腫瘤復發情形，術後罹病處外觀平坦，無皮膚凹陷或局部硬塊，開刀殘存疤痕在外觀上並不明顯，我們的病患對於術後的結果及外觀均十分的滿意。