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Original Article

Stealth surgery: Subcutaneous endoscopic excision of benign lesions of head, neck and trunk in children

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Abstract

BACKGROUND: Subcutaneous endoscopic excision of benign lesions of the head, neck and trunk is a new dimension in paediatric minimally invasive surgery. This study is a case series where cases are operated endoscopically with minimal scars. **PATIENTS AND METHODS:** This is a prospective study where in 13 patients who underwent Stealth surgery were enrolled in this study. Factors such as intraoperative time, blood loss, intraoperative complications, postoperative recovery and appearance and placing of minimal scars at inconspicuous sites were taken into consideration. **RESULTS:** All patients underwent successful surgery without converting to open surgery. Out of 13 patients, five were torticollis, four were suprasternal dermoid, one had chest wall swelling, one had swelling of arm, one had back lipoma and one had forehead lipoma. The mean operation time was 50 min (range 32-70). All patients were followed up regularly postoperatively. All patients were operated as daycare, less postoperative pain, no evident scars, lower complications related to scars. **CONCLUSION:** Subcutaneous endoscopic surgery addresses concerns related to scarring by replacing large visible incisions with smaller incisions placed in inconspicuous locations. This is a safe and effective procedure of early recovery.

Key words: Endoscopic subcutaneous excision of benign swellings, primary hyperparathyroidism, stealth surgery

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INTRODUCTION

Swellings of the head, neck and trunk are almost benign in nature. The most common benign swellings that we come across are lipomas, osteomas, pilomatrixomas and dermoid cysts.[1] Most of these lesions are in the subcutaneous plane. Common method of treating these swellings is to make incisions over the lesion and excise in toto, resulting in scar. Although, in most cases, incisions are placed in skin creases to prevent bad scars. A scar is something that cannot be predicted and the results are not very pleasing to the patient and the family. Many surgical specialities used subcutaneous endoscopic techniques, placing incisions over hidden areas with a goal of scarless surgery. This technique is commonly referred to as Stealth surgery, which derives its name from the word "stealth", meaning hidden. Stealth surgery entails performing laparoscopic subcutaneous excision of these benign swellings by replacing larger incisions to smaller incisions and placing them in small inconspicuous areas.[2]

We present a series of cases of benign swellings over back, forehead, chest wall, suprasternal region and torticollis, where, similarly, we approached by subcutaneous endoscopic surgery.

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PATIENTS AND METHODS

This is a prospective study, where in 13 cases were operated from March 2011 to May 2015. Out of 13 patients, five were torticollis (two males and three females) and, four were suprasternal dermoid (three females and one male), one had chest wall swelling (female), one had swelling of arm (male), one had back lipoma (male) and one had forehead lipoma (female) [Table 1].

All procedures are performed at a university teaching hospital. All families gave consent to proceed with an endoscopic approach after the potential risks and complications of both endoscopic risk and the risk for conversion procedures have been clearly explained.

Surgical technique

Depending on the site of lesion, the port sites were planned. If the lesion was in the chest or the back, the axilla was the preferred site of port placement. If the forehead was involved, we inserted the ports in the scalp hairline. After making a small incision for the port, a subcutaneous space was created with a peanut swab, so as to create an operating space for dissecting the lesion. Subsequently, the port was inserted and CO_2 inflation was done to distend the subcutaneous space [Figure 1]. Once pneumodistention of the subcutaneous space was done, two other working ports were introduced under vision. A triangulation was made between the ports so that it was ergonomically feasible to dissect the lesion [Figure 2]. Care was taken to achieve haemostasis and to not burn the overlying skin while separating the lesion from the overlying skin. The lesion was removed from one of the port sites, making sure it was in one of the inconspicuous locations. All the gas was squeezed out of the subcutaneous space and a tight compression dressing was kept for 24-48 h, so that it did not form a seroma.

postoperative course and follow-up

All patients are discharged in on the same day and a simple analgesic such as paracetamol was prescribed. The first follow-up visit was 1 week after operation, at suture removal time. At the time of visit, patients were checked for wound complications.

RESULTS

All procedures were completed successfully using endoscopic method. There were no conversions to open surgery. The mean operation time was 50 min (range 32-70 min). Blood loss ranged 10-20 mL, which was minimal. All patients are followed up regularly postoperatively. Hospital stay was less than 24 h in all patients, as they were operated as daycare cases. Pain score ranged 2-5 using the Wong Baker Scale, which was adequately managed by oral paracetamol. There were no intraoperative complications or subcutaneous emphysema. There were complications with hand swelling having seroma, managed conservatively and one torticollis in an adolescent boy who took a long time to return to normal movement. Scar was inconspicuous, as it was in the axilla or hairline, depending on the pathology. There was no wound infection and healing was adequate and satisfactory. There was no haematoma or ecchymosis of the skin. All scars healed well with an excellent cosmetic result [Figure 3].

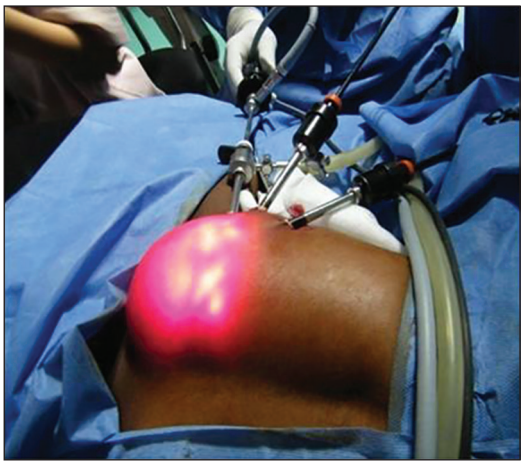

Figure 1: Pneumo distension of the subcutaneous space

Table 1: Age, sex, diagnosis, dimensions of the lesion and ports used

Diagnosis	Sex	Age in years	Dimension	Ports
Back lipoma	M	8	5 cm×4 cm	3 mm×5 mm
Chest wall swelling	F	6	3 cm×2 cm	3 mm×5 mm
Arm swelling	M	9	2 cm×2 cm	3 mm×5 mm
Torticollis	2 M and 3 F	10 and 2 8, 9, and 2 respectively	—	3 mm×5 mm
Forehead lipoma	F	14	2 cm×2 cm	1 mm×10 mm 2 mm×5 mm
Suprasternal dermoid	3 F and 1 M	9, 10, 2, and 3 respectively	2 cm×2 cm 3 cm×2 cm 3 cm×3 cm 2 cm×2 cm	3 mm×5 mm

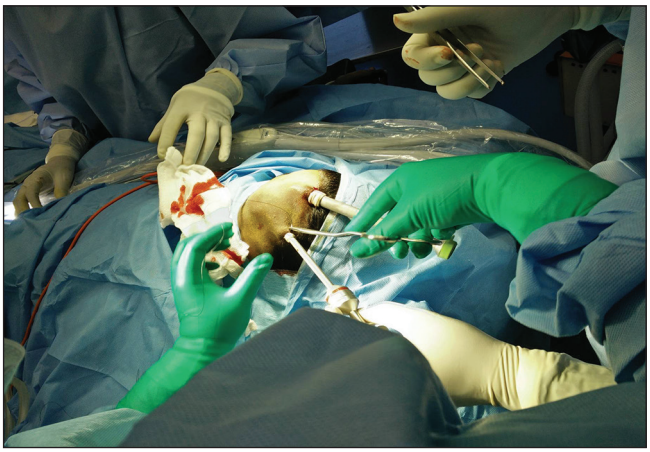

Figure 2: Placements of the ports ergonomically

Figure 3: Well-healed and aesthetically acceptable scar

DISCUSSION

All benign conditions of the head and the neck are classically excised by incision over the lesion and removing the swelling *in toto*, but resulting in a disfigured and ugly scar. Surgical scars of the face and the neck can have a lifelong impact on the self-esteem and socialisation of patients.[3] Scarring can cause significant pain and discomfort, particularly in patients prone to hypertrophic scar and keloid formation.

The potential complications of infection, seroma, haematoma formation, are very much there in our case series. A recent qualitative study by Brown *et al*.[4] of 34 patients aged 14-70 years, with varying scars, assessed their physical comfort and functioning, acceptability to self and others, social functioning, confidence in the nature and management of the condition and emotional well-being. They found that most patients (56%) were unsatisfied with the appearance of their scar and 18% of patients' specifically noted anxiety surrounding participation in leisure activities such as swimming and sunbathing. Furthermore, 50% patients reported lowered self-confidence, 26% patients reported pain and 44% patients reported itching. Taking this into consideration, it is in best interest of the surgeon to try to avoid the scar formation wherever and whenever is required.

This case series shows our experience in dealing these benign lesions by a novel new dimension in minimally invasive surgery called Stealth surgery.[5,6] In a transaxillary approach for torticollis, there are no major neural and vascular structures encountered during the tunneling. Care should be taken while tunneling to make sure the plain is above the pectoralis fascia and not to traverse through the platysma, as this is a thin muscle. In patients undergoing torticollis correction, they should be counselled regarding the importance of physiotherapy in regaining the function back.[3]

In forehead and suprasternal midline lesions, appropriate imaging has to be done to rule out extension into the cavities.[7] In none of our cases was there intracranial extension. Especially for forehead midline benign swellings, to rule out the intracranial extensions and placement of ports in this area to be grossly taken care of, unlike the transaxillary, as there are named functional nerves present on either side of the midline such as the supratrochlear and supraorbital nerves. Damage to these nerves is not feasible.[8,9] Sometimes, if the cysts break and the contents are released into the cavity, the released contents can be cleared by suction, with a wash to be given.[1]

Stealth surgery is a simple and effective way to deal these lesions and avoiding the larger incisions and thereby avoiding the scars. Operative times are reasonably fair, compared to other series. Blood loss is not a major complication as seen in our series.[10] Endoscopic techniques are relatively safer in removing the benign lesions with excellent cosmesis. Paediatric surgeons can adopt these techniques with basic minimal access surgical skills. Similar techniques may be useful for the removal of benign masses and other exposed regions of the body, where there is an option of placing the scar in the hidden areas.[11]

CONCLUSION

Subcutaneous endoscopic surgery addresses concerns related to scarring by replacing large visible incisions with smaller incisions placed in inconspicuous locations. This is a safe and effective procedure leading to early recovery. It should be preferred operation in children with benign swelling in exposed areas of the body.

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Conflicts of Interest

There are no conflicts of interest.

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