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RESEARCH ARTICLE

Comparison of Various Surgical Techniques in Management of Auricular Seroma

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Abstract: Auricular seroma is a rare, benign, and asymptomatic condition of the auricle that, if left untreated, may lead to permanent deformity. Although excision and drainage (the window method) are widely recognized, conservative methods often result in recurrence. This study aims to evaluate the success and complication rates of various treatment modalities. This observational study was conducted in the ENT department on 40 patients with auricular seroma, divided into four groups of 10 each. Group A underwent the window procedure, Group B the button technique, Group C grommet insertion, and Group D corrugated drain insertion. All patients received antibiotics, and outcomes were assessed based on recovery and complications. The window procedure had a mean duration of 25.9 minutes and 5 ml blood loss; one patient experienced mild deformity and colour change. Grommet insertion had the shortest duration (13 minutes) and 4.6 ml blood loss, with no complications or deformity. Button technique averaged 29.2 minutes and 4.3 ml blood loss; one patient showed colour change. Corrugated drain insertion lasted 18 minutes with 4.2 ml blood loss and one case of colour change. All techniques resulted in scar formation without pain, hematoma, or recurrence. Grommet insertion and corrugated drain insertion are optimal techniques for auricular seroma due to their minimal complication rates, lower blood loss, shorter duration, and absence of deformity.

Keywords: Auricular seroma, grommet insertion, corrugated drain, window procedure, ear deformity prevention.

INTRODUCTION

Auricular seroma is a rare, benign, asymptomatic, and non-inflammatory disorder that mostly affects the auricle, or external ear [1]. It is usually identified by the development of an intra-cartilaginous cyst that is conspicuously devoid of an epithelial lining and contains a sterile, straw-coloured serous fluid [2]. People in their third to fourth decades of life, notably those between the ages of 30 and 40, are the most often diagnosed with this condition. There is a stronger preference for men, according to epidemiological statistics. This discrepancy may be due to hormonal factors, including the effects of testosterone, as well as pro-inflammatory cytokines, such as interleukin. Although bilateral involvement is more typical in pediatric populations, the ailment more usually affects the right auricle as opposed to the left [3].

Although they may form in any part of the auricle, auricular seromas are more likely to form in the scaphoid fossa [4]. It is thought that the pathophysiology is intimately linked to recurrent mild trauma, which aids in the enzymatic breakdown of auricular cartilage. Seroma development and cartilage fragmentation are the final results of this deterioration [5]. Auricular seromas may cause irreversible external ear deformity and ugliness if they are not treated quickly and successfully, which highlights the need of fast management.

Generally speaking, medical therapy—including pharmaceutical management—has been shown to provide insufficient outcomes. As a result, surgery is often considered the most efficient and conclusive form of therapy [6]. Systemic corticosteroids have been used in some situations, but their use is still debatable and they are often seen to be ineffectual in resolving the problem over the long term. Numerous surgical techniques have been put forward and used, with varying degrees of effectiveness [7].

Historically, the main therapeutic approach was incision and drainage; however, this approach has a high risk of recurrence, which limits its clinical usefulness [8]. The window approach of draining and excision is a more sophisticated and successful procedure that has gained popularity. In addition to draining the serous fluid, this technique involves surgically excising a piece of cartilage and the perichondrium that covers it [9]. This method has shown better esthetic results and reduced recurrence rates. Conservative management strategies, including basic aspiration, on the other hand, often lead to subpar results and relapses [10].

Numerous approaches of treating this benign but potentially deformable syndrome have been documented in the literature throughout the years. These vary from simple needle aspiration to more intricate surgical techniques, such as cutaneous operations that require skin de-roofing and careful debridement with a diamond burr. A number of

intralesional treatments has also been tried, especially those, that uses corticosteroids, although the results have often been disappointing in terms of recurrence and aesthetic consequences [11].

The goal of the current research is to assess the effectiveness and success rates of many surgical techniques used to treat auricular seroma, such as the window process, buttoning method, grommet insertion, and corrugated drain insertion. Additionally, the research intends to methodically evaluate the frequency and kind of post-procedural consequences, including hematoma development, scarring, skin color changes, auricular abnormalities, and postoperative discomfort. By determining the best treatment option, reducing side effects, and refining the overall procedural strategy, the ultimate objective is to improve patient care.

MATERIAL AND METHODS

The main goal of this observational research, which was carried out at a tertiary care center's Department of Otorhinolaryngology (ENT), was to assess and contrast the efficacy and results of different surgical procedures utilized to treat auricular seroma. The Institutional Ethical Committee's ethical permission was properly acquired before the research started. All participants provided informed written permission, guaranteeing compliance with ethical standards and the voluntary participation tenets.

Adult patients with a clinical diagnosis of auricular seroma, including those with a history of repeated episodes, who were at least 18 years old were included in the research. To confirm the diagnosis and rule out other comparable illnesses, a thorough clinical examination and standard investigations were carried out. To maintain a consistent patient group and reduce confounding variables, patients who had pre-existing auricular abnormalities such cauliflower ear, infected ear seroma, or indications of perichondritis were not allowed to participate in the research.

Forty eligible patients in all were recruited and divided into four equal groups of ten people each at random. Every group had a different kind of surgery. The window operation, which included draining of the seroma and excision of a part of the perichondrium and cartilage, was used to treat the patients in Group A. The button approach, which was used to Group B, was designed to compress the cavity and stop fluid from reaccumulating. Grommet insertion, a minimally invasive technique that allowed for continuous fluid drainage, was performed on Group C. A corrugated rubber drain, which is intended to provide extended drainage and reduce the likelihood of recurrence, was inserted to handle Group D.

To avoid subsequent infections, all patients were given a conventional postoperative regimen that included the right amount of antibiotic treatment. In order to relieve discomfort, analgesics were given as required. The time needed for full recovery, the frequency of problems (such as hematoma development, infection, scar formation, deformity, and discomfort), and seroma recurrence were among the postoperative measures used to assess the results. To track recovery, identify any side effects, and record patient satisfaction, follow-up evaluations were carried out on a regular basis.

PROCEDURE

WINDOW PROCEDURE

Under aseptic conditions and local anesthesia, the ear was prepared with Betadine, and a curvilinear incision was made at the most dependent part of the swelling to facilitate fluid drainage and flap elevation. The infected cartilage was excised, and a Betadine-soaked wick was placed, followed by dressing with a compression bandage. **(Figure 1)**

Figure 1: Window Procedure

BUTTONING

Under aseptic conditions and local anaesthesia, the ear was prepared with Betadine. An incision was made at the most dependent part of the swelling to facilitate fluid drainage. Subsequently, a buttoning was done with appropriate size button with both sides of swelling and through and through suturing was done the area was dressed with a compression bandage. **(Figure 2)**

Figure 2: Buttoning

GROMMET INSERTION

Under aseptic conditions and local anaesthesia, the ear was prepared with Betadine. An incision was made at the most dependent part of the swelling to facilitate fluid drainage. Subsequently, grommet insertion was done the area was dressed with a compression bandage.

CORRUGATED DRAIN INSERTION

Under aseptic conditions and local anaesthesia, the ear was prepared with Betadine. An incision was made at the most dependent part of the swelling to facilitate fluid drainage. Subsequently, corrugated drain insertion was done the area was dressed with a compression bandage. **(Figure 3)**

Figure 3: Drain Insertion

RESULTS AND OBSERVATIONS:

Table 1: Number of patients who undertook previous treatment (n = 40)

PREVIOUS TREATMENT	COUNT	%
CORTICOSTEROID INJECTION	6	15%
INCISION AND DRAINAGE	14	35%
NEEDLE ASPIRATION	7	18%
NIL	13	32%

Figure 4: Mean duration and average blood loss in different techniques

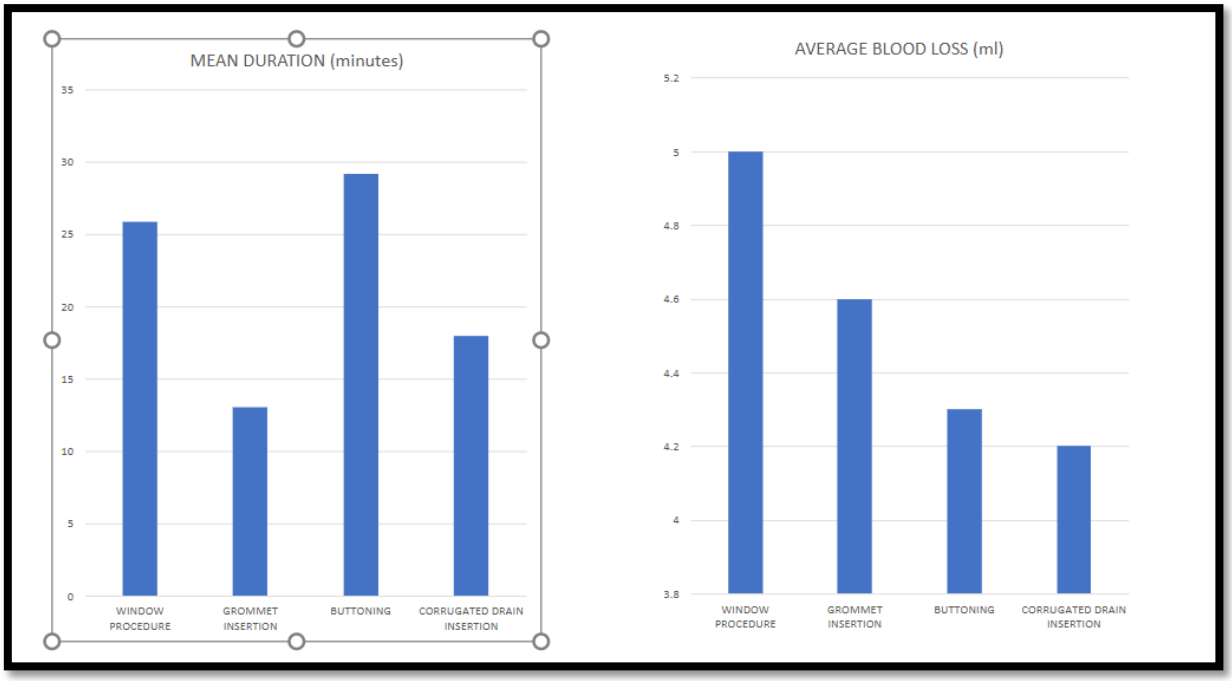
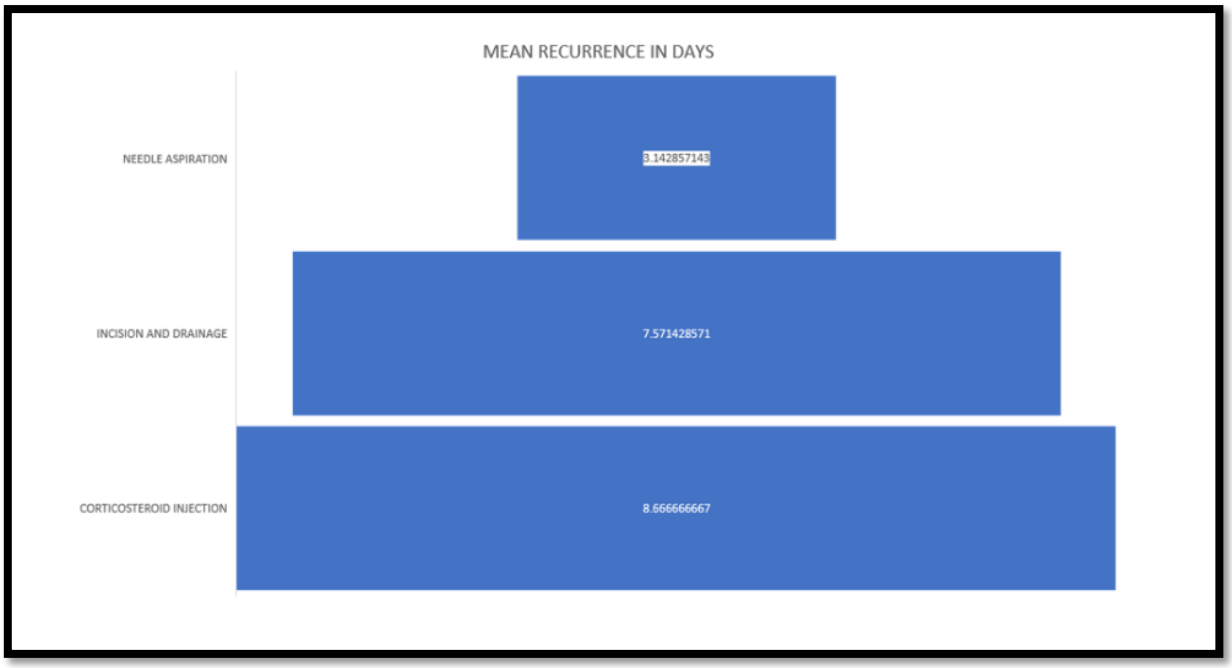


Figure 5: Mean recurrence of auricular seroma in days after conservative treatment



Incision and drainage was the most often used previous intervention among them, having been carried out in 14 patients (35%). Six patients (15%) had received corticosteroid injections, and seven patients (18%) had tried needle aspiration.

Interestingly, 13 individuals (32%) had never received therapy before taking part in this research. According to this findings, patients who were previously treated conservatively may be at risk for recurrence or treatment failure. **(Table 1)**

Window Procedure: The mean duration of the window procedure was 25.9 minutes, with an average blood loss of 5 ml. This procedure was free of complications, although a scar was present. The resulting deformity was mild, occurring in 10% of patients. There was no pain, hematoma, or recurrence observed, although one patient experienced a change in colour. **(Figure 4)**

Grommet Insertion: The mean duration of grommet insertion was 13 minutes, with an average blood loss of 4.6 ml. This procedure was also free of complications, with a scar present. There was no deformity, pain, hematoma, or recurrence associated with this method. **(Figure 4)**

Buttoning: The mean duration of the buttoning procedure was 29.2 minutes, with an average blood loss of 4.3 ml. This procedure was free of complications, although a scar was present. There were no instances of deformity, pain, hematoma, or recurrence associated with this method, although one patient experienced a change in skin colour **(Figure 4)**

Corrugated Drain Insertion: The mean duration for the insertion of the corrugated drain was 18 minutes, with an average blood loss of 4.2 ml. This procedure also did not result in any complications, although a scar was present. Similar to the buttoning method, there were no occurrences of deformity, pain, hematoma, or recurrence, with one patient reporting a change in skin colour. **(Figure 4 & 5)**

DISCUSSION

Grommet insertion (13 minutes) was the procedure with shortest duration and buttoning (29.2 minutes) being the longest ,others procedures were window procedure (25.9 minutes), corrugated drain insertion (18 minutes) respectively. Corrugated drain insertion (4.2 ml) had minimal blood loss were window procedure (5 ml) had maximum blood loss , others like grommet insertion (4.6 ml), buttoning (4.3 ml) respectively. No complications reported in any procedures. Scar formation is there in all procedures. One patient who underwent window procedure showed deformity whereas other patients had no deformity. Colour change was noted in buttoning (one patient), corrugated drain insertion (one patient) window procedure (two patients) and none in grommet insertion. No pain reported in postoperative period. No haematoma reported in postoperative period. No recurrence reported for any procedure till date.

The potential risk associated with compressive techniques, such as buttoning for pressure application, may include pressure necrosis and perichondritis if the button is too tight.

Nirwan S et.al reported that buttons which are readily available have been found very helpful as stitch dressing g in the management of auricular seroma/hematoma [12]. In our study, grommet insertion was the shortest procedure (13 minutes), while buttoning required the longest time (29.2 minutes). These findings align with existing literature [13] where tympanostomy tube (grommet) insertion is noted for its efficiency, particularly when performed under general anesthesia, which also results in reduced procedural discomfort and high parental satisfaction. Endoscopic approaches have further contributed to reduced operative times compared to traditional microscopic techniques, as previously reported [14].

Regarding blood loss, corrugated drain insertion showed minimal blood loss (4.2 ml), and the window procedure had the highest (5 ml). While direct blood loss comparisons are limited in literature, study on tympanoplasty and related surgeries support that minimally invasive methods, including endoscopic and TEES techniques, are associated with lower intraoperative trauma and complications [15].

Notably, we observed no intraoperative or postoperative complications across all procedures. This aligns with the literature which reports low complication rates for paediatric ear surgeries, especially when using endoscopic techniques [16]. Scar formation, although present in all patients, was not associated with pain or recurrence—a trend consistent with well-executed tympanoplasty outcomes [17].

Deformity was rare, with only one case observed following a window procedure. Similarly, color changes in the surgical area were infrequent and appeared in isolated cases across all procedures except grommet insertion. These minor postoperative findings did not affect functional outcomes, a finding echoed in the literature which emphasizes good cosmetic and functional recovery in most paediatric ear procedures [18].

Grommet insertion is characterized by the shortest duration and minimal blood loss, with no associated deformity or color change, and a recovery period of 6-10 days. The window procedure, in contrast, results in the highest blood loss and moderate color change, but no recurrence, with a recovery period of 14-20 days. Buttoning involves the longest duration and color change, with a recovery period of 10-12 days. Corrugated drain insertion is associated with the least

blood loss and shorter duration, with no deformity, and a recovery period of 6-10 days.'

The use of a corrugated drain is reported to be an optimal technique for managing auricular seroma. The change in skin color may be attributed to the non-porosity of the rubber sheet. This method is straightforward, can be performed by less skilled surgeons, and is extremely cost-effective, preventing recurrence and preserving the aesthetics of the auricle [19]. This is corroborated by another study which asserts that the corrugated rubber drain offers a simple, minimally invasive, and effective management strategy for seromas [20]. According to existing literature, the placement of a continuous portable suction drain at the incision site is a recommended treatment option.

Based on the present study, grommet insertion and corrugated drain insertion exhibit very low frequencies of severe outcomes such as sepsis and hematoma, rendering them safer options. If minimizing blood loss and complications is a priority, grommet insertion is preferable due to its very low incidence of these outcomes. Grommet insertion and corrugated drain insertion appear to be the safest procedures, with minimal risks and high recovery rates without significant changes.

If minimizing downtime is crucial, grommet insertion or corrugated drain insertion may be preferable. Grommet insertion and corrugated drain insertion generally have the quickest recovery times, with patients often resuming normal activities within 5-6 days. Buttoning and the window procedure have slightly longer recovery times, typically around 10-12 days.

CONCLUSION

The results of this study unequivocally show that two of the best and most efficient surgical methods for treating auricular seroma are grommet and corrugated drain implantation. Compared to other conventional and conservative procedures, these techniques have shown significant therapeutic benefits. In particular, the quickest recovery time, little intraoperative blood loss, very low complication rates, and—above all—the lack of postoperative auricular deformity are linked to both grommet and corrugated drain placement. They are quite advantageous in terms of patient pleasure and safety because of these qualities.

The capacity of these treatments to provide the best possible therapeutic outcomes while maintaining the auricle's structural and cosmetic integrity is one of its most alluring benefits. These minimally invasive treatments guarantee superior cosmetic results, which is a crucial factor in otologic surgery, in contrast to more intrusive techniques that could cause permanent deformity or visible scars. These operations' safety and effectiveness are further supported by the decreased frequency of side effects including hematomas, discomfort, or color changes thereafter.

Given these findings, it is highly advised that medical professionals and otologic surgeons prioritize grommet and corrugated drain insertion as the first surgical choices for treating auricular seroma. By using these strategies, physicians may provide their patients with the advantages of both successful seroma clearance and superior postoperative results, such as a speedier return to normal activities, more comfort, and better cosmetic satisfaction. In the end, these methods provide the best possible balance between long-term success, patient-centered care, and effectiveness in the treatment of this benign yet potentially deformity.

Conflict of Interest

None

Source of Funding

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