(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 4, Issue 5, Page No: 1128-1135
September-October 2021

IJMSCR

Decision Making For Treatment of Chylous Fistula Following Neck Surgery: A Challenge to the Surgeon

Arjun Gupta, S M Azeem Mohiyuddin, Sagayaraj A, Kouser Mohammadi, Prashanth Babu, Harshitha N, Kunal Thakur

Department of Otorhinolaryngology and Head & Neck Surgery, Sri Devaraj Urs Medical College, Kolar, India

***Corresponding Author:**
S M Azeem Mohiyuddin

Department of Otorhinolaryngology and Head & Neck Surgery, Sri Devaraj Urs Medical College, Kolar, India

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Chylous Fistula following neck surgery is an uncommon but challenging complication encountered by head and neck surgeons. This leads to skin flap necrosis, infection, vascular blow outs and chylothorax. Co-morbidities like malnutrition, diabetes mellitus, radiated neck predispose to chylous fistula. The common site of leak is thoracic duct or lower jugular lymphatics. Identification of chyle leak intra-operatively can be difficult. Chyle leaks more than 500ml/day are termed high output leaks and require re-exploration of the wound and ligation of injured lymphatic duct. Low output leaks settle down with conservative treatment like high protein and low fat naso-gastric feeds, dependent drain, aspiration of collected chyle, antibiotics and octreotide, a somatostatin derivative. Chyle leaks less than 500ml/day and more than 200ml/day are a dilemma in deciding the treatment modality. Chylous fistula not responding to conservative treatment can cause life threatening complications and contaminate or macerate the neck making re-exploration at a later stage difficult. The decision to abandon conservative treatment and the ideal time for it is controversial. We are presenting our experience with the outcome of post-operative chylous fistula in a series of 11 under-nourished patients following neck dissection for malignancies, cystic hygroma and traumatic, contaminated neck injuries. All these patients developed left sided chylous fistula measuring 300ml to 400ml/day, 2 to 4 days after surgery. They were successfully managed by re-exploration of neck and ligation of injured lymphatic duct after 3 to 5 days trial of conservative management. There were no major complications or delay in adjuvant treatment

Keywords: Chylous fistula, neck surgery, thoracic duct, complications, re-exploration and ligation, conservative management

INTRODUCTION

Head & Neck squamous carcinoma constitutes 30-35 % of all malignancies in our region. 80% of these patients present with loco regionally advanced disease requiring multimodality treatment in form of surgical resection which includes neck dissection followed by adjuvant treatment. During neck dissection particularly in supraclavicular region, the thoracic duct on left side and para-jugular lymphatic channels are at risk. Injury to these lymphatic ducts is an uncommon complication which results in chylous fistula, adversely affecting the nutrition and wound healing of the patient. The chyle can also macerate the tissues due to increased hydrostatic pressure and local inflammation resulting in wound dehiscence, fluid-electrolyte imbalance, hypoproteinemia and vascular blowouts. Chyle leaks of more than 500ml/day are termed as High Output chyle leaks. High output chyle leaks usually require re-exploration and ligation of the injured lymphatic duct. Conservative management is often successful in low output chyle leaks. It is often a dilemma whether to re-explore and ligate the lymphatic ducts in these patients or manage them conservatively when the quantity of chyle leak is significantly high but less

than 500ml. The quantity of chyle leak and duration of the fistula, nutritional and immunological status of patient, co-morbidities and risk to major blood vessels are factors which influence the management approach. We intend to document our experience with 11 cases of post-operative chylous fistula (300ml to 400ml/day) in under-nourished patients operated in our institution during the last 6 years.

OBJECTIVE

To document the complications, management and outcome of post-operative chylous fistula (300ml to 400ml/day) in under-nourished patients.

METHODS AND MATERIALS

This retrospective study was conducted by reviewing clinical case records of 11 under-nourished patients who had chylous fistula following neck surgery at a tertiary rural centre between May 2014 and April 2020.

All these patients were under-nourished and had post-operative chylous fistula between 300ml to 400ml/day following neck surgery. Among these patients, 6 had undergone modified radical neck dissection for Head & Neck malignancies, 1 had been operated for extensive cystic hygroma in the neck and 4 had undergone neck exploration following trauma (2 penetrating injuries and 2 cut throat injuries)

Revision neck dissections, metastatic cervical lymph nodes staged N3 and salvage neck dissections after radiation failure were excluded from the study.

All patients were initially treated by conservative methods like low fat diet, dependent drain, aspiration of the chyle, close monitoring, nutritional support with high protein naso-gastric feeds and antibiotics. 3 patients were administered octreotide injections in addition to the above management.

3 patients who developed chylothorax were also subjected to intercostal drain for 5 days.

Patients not responding to conservative treatment or deteriorating in spite of treatment were taken up for surgical exploration and ligation of injured lymphatic duct.

The onset of chylous fistula after surgery, quantity and duration of chyle leak before surgical intervention and the conservative management used were documented.

The complications encountered like wound dehiscence, skin necrosis, weight loss and chylothorax were documented. The outcome of treatment and delay in adjuvant treatment for malignancy cases if any were documented. Our data was entered on SPSS excel sheet and analyzed by descriptive statistics.

RESULTS

9 patients in our series were aged between 40-70 years and 1 young man aged 23 years and 1 child aged 2 years. 8 of these patients were males & 3 females. All patients had left sided chylous fistula. All these patients developed chylous fistula between the 2nd and 4th post-operative day. The quantity of chyle leak was 300ml/day in 7 patients, 350ml/day in 3 patients and 400ml/day in 1 patient. All patients in this study were under-nourished with the adult patients having average body weight of 45-55 kgs. (TABLE 1)

Among the 6 patients operated for head and neck malignancy, 3 patients had carcinoma buccal mucosa, 1 patient had carcinoma floor of mouth and 2 patients had laryngeal carcinoma. They were all staged T3 and T4a (Locally advanced disease). 1 child was operated for cystic hygroma extending from floor of mouth to the axilla. 2 patients had neck exploration for contaminated penetrating (missile) injuries in the lower part of neck. 2 patients had extensive cut throat (lacerated) injuries and underwent neck exploration.

6 patients were found to have chylous fistula on 3rd post-operative day and 5 patients developed chylous fistula on 4th post-operative day.

The chylous fistula failed to respond to conservative management in all these patients. Re-exploration of the neck along with ligation of thoracic duct was done 3 days after onset of chylous fistula in 5 patients, after 4 days of conservative management in 5 patients and after 5 days in 1 patient. (FIGURE 1, 2 & 3)

The site of leak was in a major tributary of the thoracic duct adjoining the drainage of internal jugular vein into subclavian vein in 6 patients and from a major tributary of thoracic duct parallel and medial to the phrenic nerve in 5 patients.

Volume 4, Issue 5; September-October 2021; Page No 1128-1135

The chylous fistula settled down soon after the re exploration and ligation of the injured lymphatic vessel and thoracic duct in all patients.

The most common complication of chylous fistula was wound dehiscence seen in 5 patients followed by chylothorax seen in 4 patients. 1 patient had skin flap necrosis which was debrided. 4 patients suffered from weight loss of more than 5% their body weight. In the 4 patients who had chylothorax, the intercostal drain was removed on the 5th day after neck re-exploration. (FIGURE 4)

All patients had complete recovery within 2 weeks of re exploration and ligation of the injured lymphatic duct. None of the patients with malignancy had a delay in starting adjuvant radiotherapy. (FIGURE 5)

All patients had minimum follow up of 1 year and mean follow up of 3 years. 2 patients with head & neck malignancy died of recurrence more than 1 year after surgery.

DISCUSSION

In our study involving 426 neck dissections, chylous fistula was seen in 11 patients. The incidence of chylous fistula in our study was 2.5%.

In literature, the incidence of chylous fistula following neck dissection varies between 0.5% to 2.5%.[1] The incidence of chylous fistula is less following functional neck dissection (0.5-1%) compared to radical neck dissection (2-4%). In our series all patients underwent modified radical neck dissection. All 11 patients in our series had chylous fistula from the left side. Other studies have also reported chylous fistula to be more common on left side.[1]

Radiotherapy, malnutrition, surgery for recurrence and large metastatic nodes with extra capsular extension of disease are known risk factors for chyle leak.[2] However, in our series all patients were under-nourished but did not have any other co-morbidity.

In our study, the leak was detected between 2nd to 4th post-operative day, the 3rd post-operative day being the most common. In literature, the detection of chylous fistula is common between 1st to 5th day, the most common being 2nd and 3rd post-operative day. [3,4]

The reason for fistula not being detected soon after surgery can be attributed to overnight fasting prior to surgery, low fat diet and hypovolemia/dehydration immediately following the surgery.[5] The build up of pressure following ligation of thoracic duct or one of its larger tributaries can also lead to a late leak or chylothorax. In our series, all the chylous fistulas were identified by milky turbid fluid in the drains, fluid collection under the skin flap and larger quantity of drainage. This was confirmed by analysis of the drain fluid. Similar findings for detection and confirmation of chylous fistula have been identified in other studies.[5,6]

In our series, majority of the patients were undernourished due to poor economic condition and advanced malignancy. This could have predisposed to chylous fistula.

In our series, conservative treatment in form of low fat diet, high protein diet, negative pressure wound therapy and aspiration was tried for 4 to 5 days. [7,8] Octreotide was also administered in 3 patients. (27.3%) However, failure to respond to conservative treatment or increase in collection of chyle under the skin flap was treated by surgical exploration and suture ligation of the thoracic duct or its injured tributary.[9]

In literature, various conservative modalities of treatment have been tried like, no fat or low fat diet, medium chain triglycerides as they reduce circulation of chyle, pressure dressing which is controversial, negative pressure wound treatment which is also controversial, somatostatin and its analogue like octreotide, sclerotherapy for small leaks, lymphoembolization etc. These can prolong hospital stay, escalate cost of treatment, may not be feasible in a rural institution and carry higher risk of major complications like chylothorax, vascular blow outs, dehydration and electrolyte imbalance.[5]

In our series, the relatively short conservative treatment and early surgical intervention was followed because all our patients either had locally advanced malignancy (6 patients) or contaminated trauma to neck (4 patients) which required either sacrifice of sterno-mastoid as part of neck dissection or debridement of the muscle. Our patients also belong to lower socio-economic group and are undernourished. This makes them unsuitable for prolonged conservative treatment due to cost, chances of inflammation due to the collected chyle

Volume 4, Issue 5; September-October 2021; Page No 1128-1135

with risk of vascular blow outs, further malnutrition and dehydration or delay in adjuvant treatment. Therefore, conservative treatment was not followed beyond 3rd to 5th day after onset of chylous fistula.[10]

In our experience, all patients recovered without major complications following surgical exploration and ligation of the thoracic duct or its injured tributary. This could have been due to relatively healthy bed for the thoracic duct at the root of neck as surgical intervention was relatively early which avoided inflammation or maceration of the blood vessel walls. We also used rotated levator scapulae muscle to cover the ligated vessel.[10] This could have caused local fibrosis and improved local vascularity, thereby promoting healing. Early intervention also prevented electrolyte imbalance or dehydration. Other studies have also reported good outcomes following ligation of thoracic duct or its tributary in the neck in high output chyle leaks. Other studies have also reported benefit in using rotated clavicular head of sternomastoid or levator scapulae muscle to cover the vessel.[10] Adjuvant treatment could be administered without delay in all our patients. Early intervention also reduced the hospital stay and minimized complications.

Our complications of chylous fistula included wound dehiscence(5), chylothorax(3),[11,12] partial skin flap necrosis(1). These complications were transient and did not affect the adjuvant treatment or disease outcome.

CONCLUSION

Chylous fistula is an uncommon but troublesome complication of neck dissection. The choice between conservative treatment and surgical intervention for chylous fistula depends on volume of leak, nutrition of the patient and deterioration of the clinical condition. Though, conservative treatment can be used in low volume leaks, the duration of hospitalization and incidence of major complications is higher. Surgical exploration and ligation of the injured thoracic duct or its tributary can help in relatively early and safer healing.

This study was not funded.

The institution ethics committee clearance was obtained

There is no conflict of interest among the authors

No animal or human experiments were conducted

REFERENCES

1. Gregor RT. Management of chyle fistulization in association with neck dissection. Otolaryngology—Head and Neck Surgery. 2000 Mar;122(3):434-9.
2. Santaolalla F, Anta JA, Zabala A, Del Rey Sanchez A, Martinez A, Sanchez JM. Management of chylous fistula as a complication of neck dissection: a 10-year retrospective review. European journal of cancer care. 2010 Jul;19(4):510-5.
3. Al-Khudaris S, Vitale L, Ghanem T. Recurrent high output chyle fistula post neck dissection resolution with conservative management. Laryngoscope. 2010 Jan 1; 120(Suppl 4):S141.
4. Delaney SW, Shi H, Shokrani A, Sinha UK. Management of chyle leak after head and neck surgery: review of current treatment strategies. International journal of otolaryngology. 2017;2017.
5. Campisi CC, Boccardo F, Piazza C, Campisi C. Evolution of chylous fistula management after neck dissection. Current opinion in otolaryngology & head and neck surgery. 2013 Apr 1;21(2):150-6.
6. A. Jain, S. N. Singh, P. Singhal, M. P. Sharma, and M. Grover, "A prospective study on the role of Octreotide in management of chyle fistula neck," *Laryngoscope*, vol. 125, no. 7, pp. 1624–1627, 2015.
7. G. G. Nyquist, A. Hagr, S. E. Sobol, M. P. Hier, and M. J. Black, "Octreotide in the medical management of chyle fistula," *Otolaryngology—Head and Neck Surgery*, vol. 128, no. 6, pp. 910–911, 2003.
8. N. Suslu, B. Sozeri, A. S. Hosal, and M. Demircin, "The role of somatostatin treatment in the management of chylous fistula after neck dissection," *Turkish Archives of Otolaryngology*, vol. 52, no. 1, pp. 39–42, 2014.
9. D. Ahn, J. H. Sohn, and J. Y. Jeong, "Chyle fistula after neck dissection: an 8-year, single-

center, prospective study of incidence, clinical features, and treatment," *Annals of Surgical Oncology*, vol. 22, supplement 3, pp. 1000–1006, 2015.

10. G. S. Fitz Hugh and R. Cowgill, "Chylous fistula: complication of neck dissection," *Archives of Otolaryngology*, vol. 91, no. 6, pp. 543–547, 1970.
11. Gómez-Caro AA, Moradiellos Diez FJ, Marrón CF, Larrú Cabrero EJ, Martín de Nicolás JL. Conservative management of postsurgical chylothorax with octreotide. Asian Cardiovasc Thorac Ann. 2005;13:222–224
12. Sieczka EM, Harvey JC. Early thoracic duct ligation for post-operative chylothorax. J Surg Oncol. 1996; 61:56–60.

TABLE 1: ONSET, QUANTITY (ml) PER DAY & DURATION OF CHYLE LEAK PRIOR TO SURGERY

Sl no.	ONSET (Post operative day)	QUANTITY(ml)/DAY	DURATION(days)
1	3	300	5
2	4	300	4
3	3	300	5
4	3	350	4
5	3	400	3
6	4	300	4
7	4	350	5
8	3	300	5
9	4	300	3
10	4	350	4
11	3	300	5

Volume 4, Issue 5; September-October 2021; Page No 1128-1135

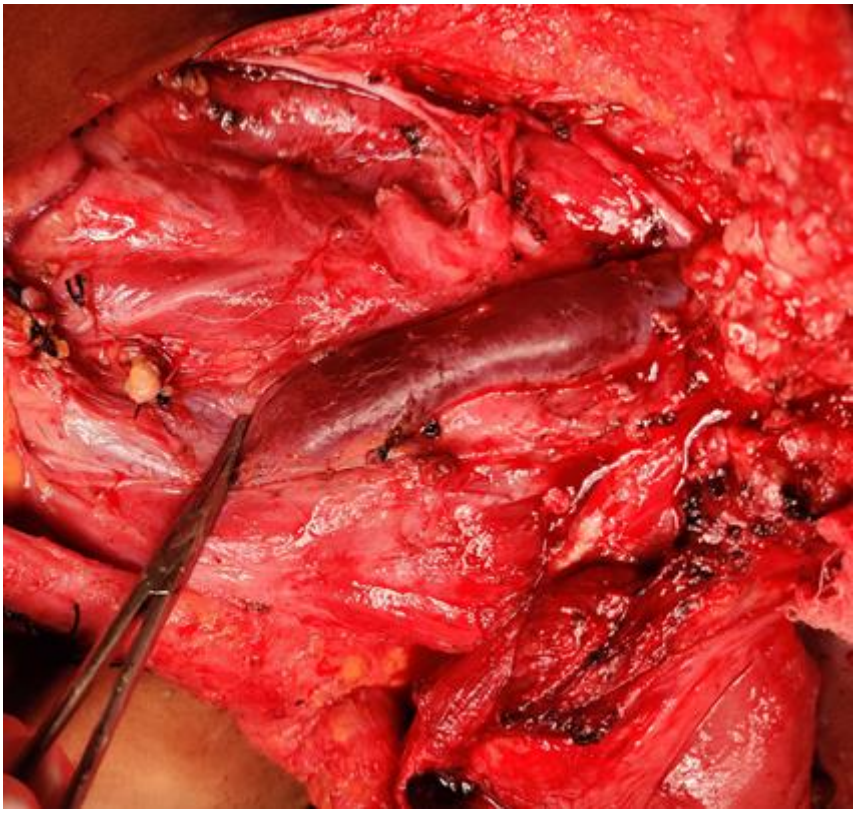


Figure 1: Injured Tributary of Thoracic Duct Ligated Adjoining the Phrenic Nerve

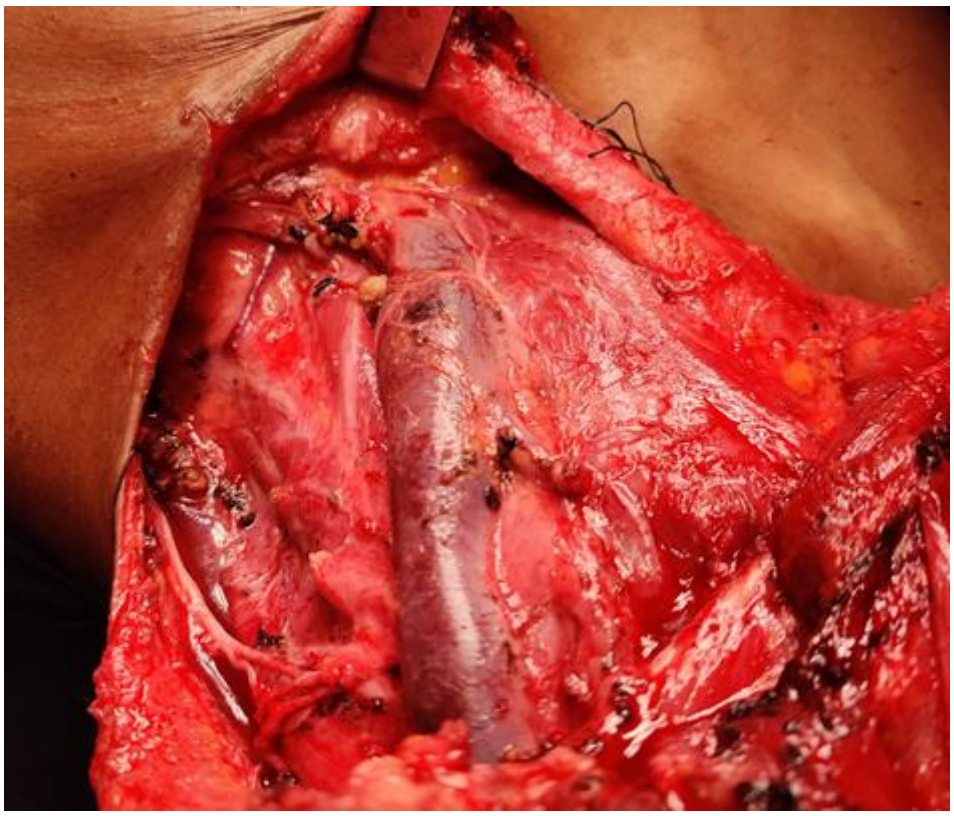


Figure 2: Ligated Thoracic Duct Adjoing Lower Part of Internal Jugular Vein

Volume 4, Issue 5; September-October 2021; Page No 1128-1135

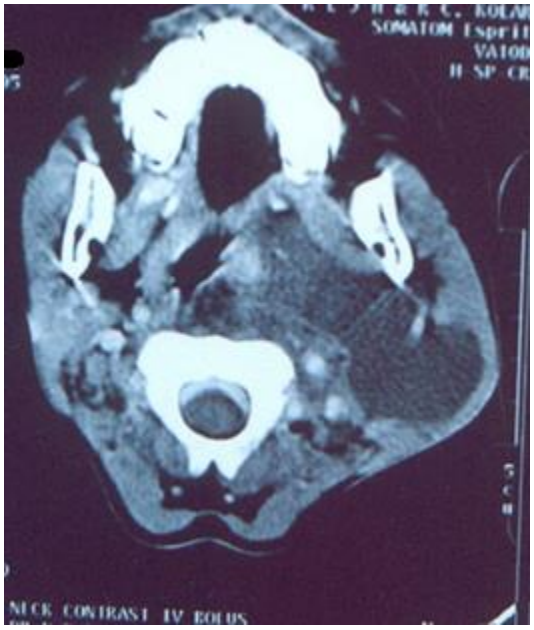
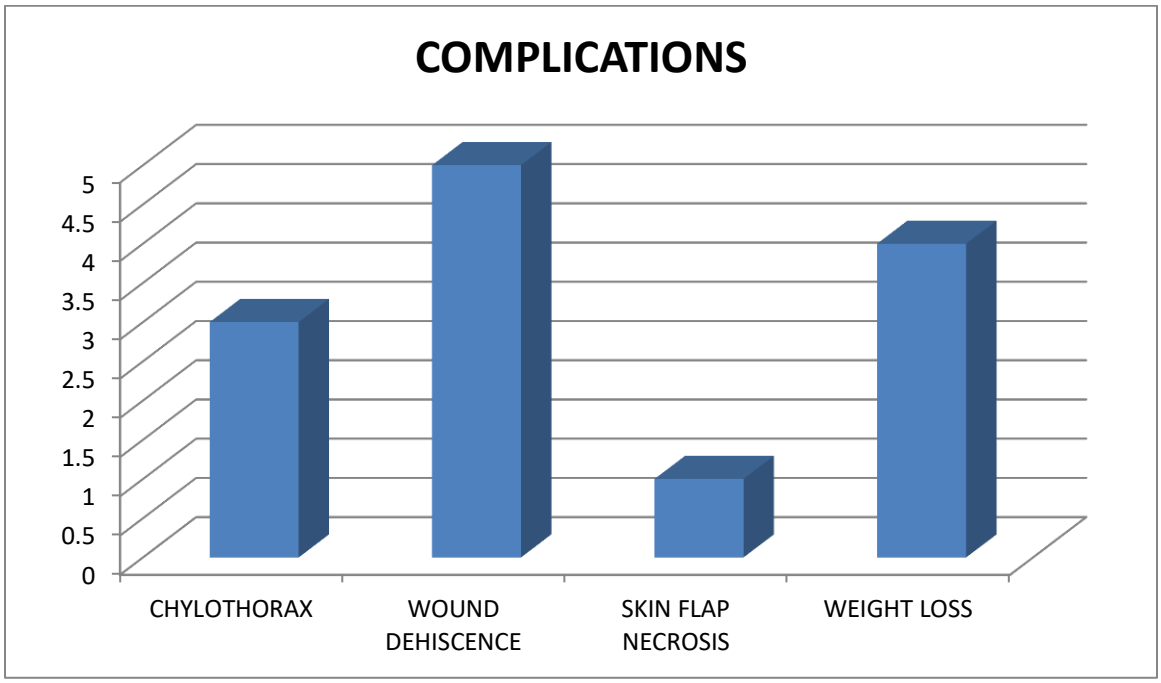


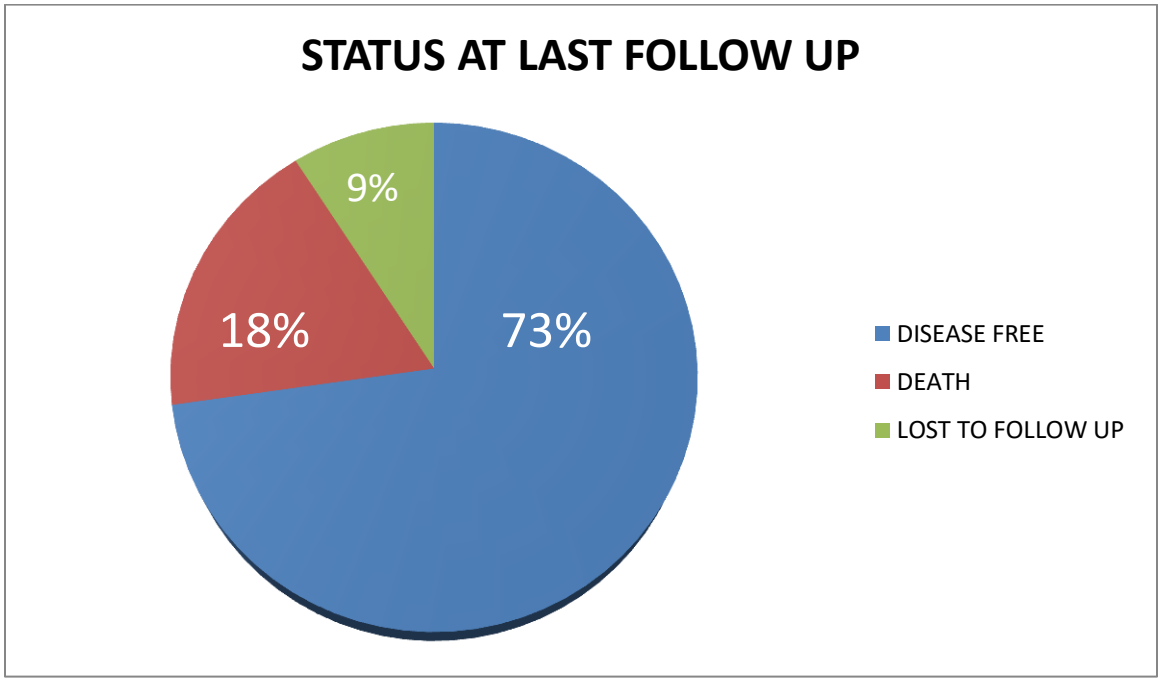
Figure 3: Left Sided Cystic Hygroma in A Child

FIGURE 4: COMPLICATIONS



Volume 4, Issue 5; September-October 2021; Page No 1128-1135

FIGURE 5: Outcome



Volume 4, Issue 5; September-October 2021; Page No 1128-1135