VOLUME - 11, ISSUE - 02, FEBRUARY - 2022 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Neurosurgery

# DYSPHAGIA FOLLOWING ANTERIOR CERVICAL SPINE SURGERY: A TWO YEAR PROSPECTIVE STUDY

**Prof. Dr Mrinal Bhuyan** — Head of Department of Neurosurgery, Gauhati Medical College & Hospital.

**Dr. Nayan Jeet Deka*** — Senior Resident Department of Neurosurgery, Gauhati Medical College & Hospital. *Corresponding Author

## ABSTRACT

**Introduction:** Incidence of dysphagia following anterior cervical spine surgery is not uncommon, in studies it has ranged from 2% to 60%. Most studies in have been done in a retrospective manner which have doubtful conclusions. We have followed up 212 case of anterior cervical spine surgery for two years and documented the risk factors in patients developing dysphagia in the follow-up period.

**Aims & objectives:** To find the incidence and risk factor for dysphagia in anterior cervical spine surgery.

**Materials & method:** It's a prospective study where patients under went operation in our institute in the year from 1st january2018 to 31st December 2019. We have completed our follow up in 31st December 2021.

**Results:** Proportion analysis (chi-square or a Fisher Exact Test), prevalence ratios, and 95% confidence intervals were used for data analysis. Female gender($p < 0.03$), revision surgeries ($p < 0.01$) and more than 3 level surgeries( $p < 0.03$) seems to be some important risk factors.

**Conclusion:** study concluded that female gender, revision surgeries and surgery done in ≥ 3 cervical levels are at risk for dysphagia.

**KEYWORDS :** Dysphagia, Anterior cervical spine surgery, Prospective study

## INTRODUCTION:

Incidence of dysphagia following anterior cervical spine surgery is not uncommon, in studies it has ranged from 2% to 60%[1-5]. Most studies in have been done in a retrospective manner which have doubtful conclusions[6].

We have done a prospective 2 year study in our institute with follow up at 1, 2, 6, 12 &24 months. We have included various patient related along with surgical variables to analyse its relationship to development of dysphagia.

## MATERIALS AND METHOD:

In our institute we are doing anterior cervical surgeries which range from Anterior Cervical Disectomy, Anterior Cervical Disectomy with fusion (using anterior plating, zero profile) & Corpectomies. A total of 240 cases were done in the year 2017 to 2018, all the cases we done by senior surgeons. General anaesthesia was used with flexometallic endotracheal tube with cuff was used. Post-operatively patients were given Philadelphia Hard collar and negative suction drain was used which was removed after 24 hours.

Patients were followed up in 1, 2, 6, 12 &24 months for dysphagia on OPD basis or telephonic conversations. Dysphagia was graded according to **Bazaz et** al grading system[5] (Table1 ).

**Table 1: Dysphagia scoring system [5]**

| | Liquid | Solid |
|---|---|---|
| None | None | None |
| Mild | None | Rare |
| Moderate | None or rare | Occasional (only to specific food) |
| Severe | Present | Frequent ( majority of solids) |

## RESULT & OBSERVATION:

Out of the 240 cases done 28 cases we dropped out of the study due to various reasons (4 had preoperative dysphagia, 2 had died due to other causes and 22 patients lost follow up).

a) Prevalence of Dysphagia : Overall prevalence of dysphagia is 52.35%,33.90%, 17.90%, 13.60% & 10.8% in 1, 2, 3,6, 12 &24months (figure1).

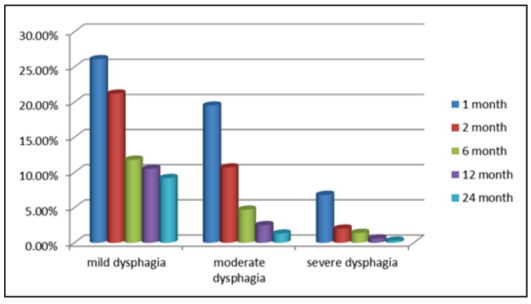


**Figure1: Overall dysphagia in patients in two years**

b) Primary versus revision surgery: a total of 176 cases had primary surgeries & 36 revisions. The incidence of dysphagia in 1, 2 &6 month were comparable in both the sets. However at 12 & 24 months the incidence of dysphagia in primary group were 10 & 9.7% respectively in compared to 25% & 22.2% in the revision group ($p < .01$). ( Table 2)

c) Gender: of the 212 case 112 are male and 102 are female. In the first 1 & 2 month the difference was comparable in both the sexes. At 6 months 25% female and 13.4% male had dysphagia ($p < 0.05$), similarly at 12 month it is 23% in females and 11.6% in males ( $p < 0.03$) and 24 months female is 19% & male 9.8% ($p < 0.02$).

**Table 2: The incidence of dysphagia in revision and primary surgeries**

| Primary | | | Revision | |
|---|---|---|---|---|
| Time in months | % of dysphagia | 95% Confidence interval | % of dysphagia | 95% Confidence interval |
| 1 | 53.9% | 47.8-59.2 | 61.1% | 45.5-75.3 |
| 2 | 30.68% | 24.8-36.5 | 47.2% | 32.3-62.8 |
| 6 | 16.4% | 13.8-22.6 | 27.7% | 14.9-44.2 |
| 12 | 10.2% | 8.4-13.2 | 25% | 14.2-41.5 |
| 24 | 9.7% | 5.8-14.1 | 22.2% | 10.1-38.3 |

**d) Corpectomies versus discectomies:**

a total of 80 cases of corpectomies were done and 132 discectomies which includes multiple level discectomies and fusion also. Incidence of dysphagia was comparable during all the time of follow up and were not statistically significant. (Table 3)

**Table 3: Incidence based on type of surgery**

| Time (months) | Discectomies( n= 132) | Corpectomies( n= 80) |
|---|---|---|
| 1 | 57.6% | 56.25% |
| 2 | 29.5% | 30% |
| 6 | 18.9% | 17.5% |
| 12 | 13.6% | 13.75% |
| 24 | 11.4% | 12.5% |

a) Implants versus no implants: Nearly in 114 patients we have used hardware and 98 patients we have used no hardware which includes autologous bone graft also. The incidence of dysphagia in implant group and non-implant group was comparable and these were statistically insignificant.

b) Number of surgical levels: Single level surgery was performed in 96 cases and 60 patients had surgery done in two levels and 36 cases had three level surgeries done. The incidence of dysphagia were initially comparable in the three groups during the follow up of 1,2 ,6 & 12 months. However at 2 years of follow up the difference in dysphagia among the patients of ≥3 level surgery and less than 3 level surgery was statistically significant ($p<0.02$) (Table 4).

**Table 4: Incidence based on number of level**

| | Single level | Two level | Three or more levels |
|---|---|---|---|
| Time (months) | % of dysphagia (n =96) | % of dysphagia (n=60) | % of dysphagia (n= 36) |
| 1 | 42.7% | 58.3% | 11.1% |
| 2 | 24% | 36.7% | 36% |
| 6 | 13.5% | 15% | 22.2% |
| 12 | 11.5% | 11.7% | 22.2% |
| 24 | 10.4% | 8.3% | 19.4% |

a) Age: Two years after follow average age of the patient presenting with symptoms were 48.4 years with SD of 9.5 years. The average age of the asymptomatic patients was 52.24 years and SD of 11.35 years.

## DISCUSSION:

As we said earlier the development of dysphagia is not uncommon after anterior cervical surgery. Moreover the exact cause of dysphagia is not unclear; the cause may an insult to the recurrent laryngeal nerve to a displaced implant after surgery. Here in our study we have tried to find the risk factors that are associated with dysphagia.

The result of the study indicates that the incidence of dysphagia is high during the early follow-up period after surgery (52.35% at one month) however at the end of two year we have found that there is steady decline (figure 1) in the incidence. Only 0.3% patients had severe dysphagia at the end of 2 years.

Revision surgery groups had more dysphagia than the primary surgery groups as evident by the significant increase in the number of cases of dysphagia 1 & 2 year of follow up. This was probably as a result of scar formation in the previous operation site leading to more retraction and tissue damage.

The prevalence of dysphagia in women was high than in males at 6, 12 & 24 months. These differences were found to be statistically significant. There is no confirmed aetiology for it but smaller anatomy in women may be a cause as suggested by other study [7]

Based on the type of surgery (corpectomy Vs. discectomy) corpectomy group had higher number of overall cases of dysphagia. This increase in the number is probably due to fact that corpectomy eventually involve more than one disc spaces. However this difference was not significant.

Nearly 114 patients had an implant placement in our study. Since the implants ranged from simple PEEK interbody device, titanium plates, expandable cage & zero profile implants the variable are non-homogenous. This means that there may be some confounding factors based on the type of implant used. We found that the difference in the groups (implant Vs. non-implant) we insignificant.

In terms of levels of surgery done we found that in patients with ≥3 surgical levels in compared to <3 surgical levels, their differences were comparable in during follow up to 1, 2, 6 &12 months. But at 24 months these differences were significant with 19.4% dysphagia in ≥3 surgical levels versus 8.3% in two surgical level groups. This difference is probably due to fact that more surgical levels leads to more scar formation and more contraction of the normal tissue.

## CONCLUSION:

Risk factors for dysphagia are multifactorial. Female gender, revision surgeries and more than 3 level surgeries seems to be some important risk factors. Type of implants used may be one of the modifiable components as suggested by some studies8 (8= the reference study) Nevertheless more research is needed to include other cause of dysphagia in anterior cervical surgeries.

## REFERENCES

[1] Smith Hammond CA, New KC, Pietrobon R, Curtis DJ, Scharver CH, Turner DA. Prospective analysis of incidence and risk factors of dysphagia in spine surgery patients: comparison of anterior cervical, posterior cervical, and lumbar procedures. Spine 2004;29:1441–6.

[2] Stewart M, Johnston RA, Stewart I,Wilson JA. Swallowing performance following anterior cervical spine surgery. Br J Neurosurg 1995;9:605–9.

[3] Winslow CP, Winslow TJ, Wax MK. Dysphonia and dysphagia following the anterior approach to the cervical spine. Arch Otolaryngol Head Neck Surg 2001;127:51–5.

[4] Yue W, Brodner W, Highland TR. Persistent swallowing and voice problems after anterior cervical discectomy and fusion with allograft and plating: a 5 to 11 year followup study. Eur Spine J 2005:677–82.

[5] Bazaz R, Lee MJ, Yoo JU. Incidence of dysphagia after anterior cervical spine surgery: a prospective study. Spine 2002;27:2453–8.

[6] Edwards CC 2nd, Karpitskaya Y, Cha C, et al. Accurate identification of adverse outcomes after cervical spine surgery. J Bone Joint Surg Am 2004;86-A:251–6.

[7] Lee MJ, Bazaz R, Furey CG, Yoo J. Risk factors for dysphagia after anterior cervical spine surgery: a two-year prospective cohort study. Spine J. 2007 Mar-Apr;7(2):141-7. doi: 10.1016/j.spinee.2006.02.024. Epub 2007 Jan 22. PMID: 17321961.

[8] Hofstetter CP, Kesavabhotla K, Boockvar JA. Zero-profile Anchored Spacer Reduces Rate of Dysphagia Compared With ACDF With Anterior Plating. J Spinal Disord Tech. 2015 Jun;28(5):E284-90. doi: 10.1097/ BSD. 0b013e 3182 8873 ed. PMID: 23429316.