Dysphagia and its Natural History After Anterior Cervical Spine Surgery

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ABSTRACT

Objective: To find out frequency of dysphagia after anterior cervical spine surgery using Bazaz dysphagia scoring.

Methods: Total of 70 patients who underwent anterior cervical spine surgery for different indications between June 2013 to June 2015 were included in the study. Age, gender, indication, level of involved vertebra, approach and type of surgery were recorded. Patients were assessed for dysphagia symptoms at 6 weeks, 3 months, and 6 months postoperatively using Bazaz dysphagia scoring.

Results: Total number of patients was 70 (n=70). Mean age of the patients was 39(±13.8), with minimum18 and maximum 65. 21(30%) were female and 49 (70%) were male. The most frequent indication for surgery was fracture with total of 42 (60%) while other indications included PID 19(27.1%), vertebral lesion/collapse 6 (8.6%), stenosis 2 (2.9%), chronic subluxation 1(1.4%). The most frequent level was **C5, C6** with 22 (31.4%) cases. 7 cases (10%) had 2 level surgery while 63 (90 %) had one level surgery. In 50 (71.4%) cases ACDF (anterior cervical discectomy and fusion) was done, while ACCF (anterior cervical corpectomy and fusion) was done in 19(27.1%) and screw fixation was done in one case of odontoid fracture. Patients were assessed for dysphagia using Bazaz dysphagia scoring after 6 weeks, 3 months and 6 months. 3 (4.3%) patients were lost at follow up. Incidence of dysphagia at 6 weeks was 61.4% (43), at 3 months was 11.4 % (8) and at 6 months was 5.7 %(4). There was no significant difference between corpectomy and ACDF regarding incidence of dysphagia. Also, sidedness of incision, level of surgery, age and sex of the patients did not affect the results. However, there was marked difference in the incidence of dysphagia between two level surgery, 2 out of 7 (28.6%) and one level surgery, 2 out of 58(3.3%) at 6 months.

Conclusion: Although postoperative dysphagia is very common after anterior cervical spine surgery, it is a fairly benign condition and its frequency and severity decreases dramatically overtime.

Key Words: Dysphagia, Natural History, Surgery, Anterior Cervical Spine Surgery

INTRODUCTION

Anterior approach to cervical spine is the most commonly used and preferred approach since smith Robinson described it in 1958 [1]. It is regarded as the safest and easiest approach to the cervical spine. Different kinds of pathologies like trauma, infection, degenerated disc diseases, tumours etc can be addressed through anterior approach [2,3]. Although it is the safest approach, it has a few complications [4,5]. One of these complications is postoperative dysphagia, which is quiet common after anterior cervical spine surgery [6].

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Dysphagia is a symptom indicative of an abnormality of the structures involved in, or their neural control, any phase of swallowing process [9]. The patient may be unable to or have difficulty in swallowing different types of liquid or solid food [7]. This may lead to frequent aspirations and recurrent chest infections. The exact cause of dysphagia is unknown [8]. The proposed causes are; pressure on esophagus from endotracheal tube and retractors, recurrent laryngeal nerve palsy and soft tissue edema [8]. Decreasing endotracheal tube pressure and pressure from retraction in some studies lead to decrease in the incidence of dysphagia [9,10], while in others without a change [11,12]. Both intraoperative and patients' factors like sex, age, co morbidities, body mass index (BMI), smoking, operative time, number of levels etc have been extensively studied but with an

inconsistent effect on the incidence of dysphagia [13,14,15].

Dysphagia is the most common complication after anterior cervical spine surgery but luckily transient in nature [7]. The reported incidence in the literature varies from 1 to 79% [7]. In majority of the cases dysphagia starts during the earl postoperative period but it may start even one month after surgery. Although the reported incidence in early postoperative period is very high, it decreases markedly with time. The persistent dysphagia at one year may be as low as 7% [17]. Regardless of this high variable incidence, 30% dysphagia rate at 3 months is somewhat persistent in many-reported studies [18].

We at our unit most frequently use anterior approach to treat different kinds of pathologies. In this study, we would like to evaluate our patients for the occurrence of dysphagia. There are few local studies on this topic and we would like to know how often this happens in our patients. Moreover, we would also like to see how it behaves with time.

METHODS

Total of 70 patients who underwent anterior cervical spine surgery for different indications between June 2013 to June 2015 were included in the study. Age, gender, indication, level of involved vertebra, approach and type of surgery were recorded. Patients were assessed for dysphagia symptoms at 2 weeks, 6 weeks, and 3 months postoperatively using Bazaz dysphagia scoring.

RESULTS

In this study, total number of patients was 70 (n=70). Minimum age of the patients was 18 years and maximum 65 years with mean age of 39 (±13.8). Total number of female patients was 21(30%) while male was 49 (70%). In our study, most of the patients presented with fracture 42 (60%) followed by Prolapsed disc 19 (27.1%). Other indications included vertebral lesion/collapse in 6 (8.6%) patients, stenosis in 2 (2.9%), and chronic subluxation in 1(1.4%) Patient.

Table 1: Etiology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fracture	42	60.0	60.0	60.0
	lesion/collapse	6	8.6	8.6	68.6
	Pid	19	27.1	27.1	95.7
	Stenosis	2	2.9	2.9	98.6
	subluxation	1	1.4	1.4	100.0
	Total	70	100.0	100.0	

C5, C6 was the most commonly involved level with 22 (31.4%) cases. Two level surgery was done in 7 cases (10%) while the rest 63 (90 %) had one level surgery. Right transverse approach was employed in 36 cases (51.4%) while in 34 (47.1 %) left sided approach was used. Preoperative neurology according to ASIA scoring system was E in 32 (45.7%), D in 13(18.6%), C in 12 (17.1%), A in 13 (18.6%).

Table 2: Neurology Grading

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A	13	18.6	18.6	18.6
	C	12	17.1	17.1	35.7
	D	13	18.6	18.6	54.3
	E	32	45.7	45.7	100.0
	Total	70	100.0	100.0	

Neurological Grading according to 'ASIA' scoring. Grade 'A' complete neurological injury below the level involved. Grade 'B' Incomplete neurological injury with sensory intact but complete motor loss. Grade 'C'

incomplete neurological injury with partial motor loss having at least 50 % key muscles below the level of injury with less than grade 3 power. Grade 'D' incomplete injury with partial motor loss having 50% key muscles below the level of injury with grade 3 or more power. Grade 'E' neurological intact.

In 50 (71.4%) cases ACDF was done and 19(27.1%) patients underwent ACCF. One case of odontoid fracture was fixed with anterior screw.

Table 3: Type of Surgery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ACCF	19	27.1	27.1	27.1
	ACDF	50	71.4	71.4	98.6
	Fixation	1	1.4	1.4	100.0
	Total	70	100.0	100.0	

ACCF= Anterior Cervical Corpectomy & Fusion. ACDF= Anterior Cervical Discectomy & Fusion.

Patients were assessed for dysphagia using Bazaz dysphagia scoring after 6 weeks, 3 months and 6 months postoperatively. 3 (4.3%) patients were lost at follow up.

Patients having no difficulty in either liquid or solid diet were graded as 'none'. Patients who had no difficulty with liquids but had rare difficulty with solid food were graded as having 'mild' dysphagia. Patients who experienced no or rare difficulty with liquids and occasional difficulty with certain solid food like meat or bread were labeled as having 'moderate' dysphagia. 'Severe' indicated none or rare difficulty with liquids and frequent difficulty with most solids. Incidence of dysphagia at 6 weeks was 61.4% (43), at 3 months 11.4 % (8) and at 6 months was 5.7 % (4). At 6 months dysphagia was present in 28.6% (2 out of 7) patients who underwent two level surgery compared to 3.3%(2 out of 58) patients who had one level surgery with p-value 0.1086. There was no significant difference between corpectomy and ACDF regarding incidence of dysphagia with p-value 0.4950. Also, sidedness of incision, level of surgery, age and sex of the patients did not affect the results.

DISCUSSION

Anterior cervical discectomy and fusion is the gold standard procedure for treating cervical disc degeneration and majority of other cervical spine pathologies. Though it is the safest approach in majority of cases but use of plates & screws, bone grafts, retraction involved in this approach may some time cause complications [20]. These complications include plate or graft dislodgment, esophagus perforation, recurrent laryngeal nerve injury and dysphagia. Out of these, dysphagia is the most common early complication but luckily improves alot with time.

After bazaz prospective study 2002, it has been extensively studied [19]. Bazaz scale is widely used, as it is simple and convenient to use. It divides dysphagia into none, mild, moderate and severe, depending on patient's difficulty in swallowing liquid or solid food. Similarly, other scales like Dysphagia Disability Index and Swallowing- quality of life questionnaire were recently introduced but are time consuming and difficult to use [21].

A recent review study on the rates of dysphagia done by Shiver MF 2017 reports 8.5 % overall dysphagia rate while 4.4 % for moderate and sever dysphagia [22]. The incidence of dysphagia below one year ranged from 6 % to 33 %. In our study, at 6 weeks the rate of dysphagia was 61.4%(43), which improved to 11.4 % (8) at 3 months and 5.7 % (4) at 6 months. Compared to this study our results are initially very high but then it gradually improves with time. High rates were in those studies that used bazaz dysphagia scoring like in ours. The classic prospective study done by Bazaz 2002 reported 50.2%, 32.2%, 17.8% and 12.5% dysphagia rates at 1, 2, 6 and 12 months respectively [21]. But moderate or severe dysphagia was only present in 4.8% patients. Our rates of dysphagia are within the reported range but on the lower side. It is difficult to draw some conclusion from this small sample. We can however presume that it may be due to the use of intermittent traction, nature of sample; majority being young and with trauma. Recently one study reported decrease in the rate and

severity of dysphagia after perioperative use of steroid [23]. We at our center routinely use steroid during surgery, which may be the cause of lower rates of dysphagia in our series.

Locally we could not find any study specifically focusing on dysphagia. In one study done on subaxial cervical fracture treatment, the author reported 24% rate of dysphagia with variable follow up as the most common and single complication [24]. Another study reported dysphagia as a transient disorder without mentioning the rates [25]. One study interestingly reported a 2.1% early dysphagia rate in patients with anterior cervical discectomy without fusion [26].

One recently done meta-analysis on the risk factors for dysphagia identified female gender, higher level, multilevel surgery and the use of anterior cervical plates having increased risk of dysphagia [27]. In contrast, in our study, only multilevel surgery had increased prevalence of dysphagia.

As it is now well determined and as mentioned earlier that dysphagia markedly improves with time and its rate goes down. In majority of the cases there is no intervention or surgery required. But one study reported improvement of dysphagia in 87% of patients after removal of anterior plate and release of adhesions [28]. They recommended removal of implants in moderate to severe dysphagia persisting beyond one year.

CONCLUSION

Dysphagia is the most common complication after anterior cervical surgery with poor understanding of its etiology. It is a fairly benign condition and its frequency and severity decrease dramatically overtime but rarely may need surgical intervention.

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