

Mirror Laryngoscopy: A Review of 43 Cases

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Abstract: This is a retrospective study of forty three mirror laryngoscopies done in a Teaching Hospital in Osogbo, Nigeria. Age range was 24-75, age group 30-39 being the mode (32.6% of cases). The m:f ratio was 1:1.5. The commonest indication was pre-operative evaluation for thyroidectomy (46.5%). Among these 80% were female and 20%, male. Laryngoscopy findings were normal in 95% of this group. Other indications were: Hoarseness (37.2%), Globus pharyngeus (9.3%), foreign bodies in the throat (4.7%) and Dysphagia (2.3%). There were more males (56.5%) than females (43.5%) among those who had IDL done for other indications. For this group, there were positive findings in 69.6% all the cases presenting with hoarseness-laryngeal masses in 50%, hyperaemia and indurations in 31.25%, Singers nodes in 12.5% and Vocal Cord Paralysis in 6.25%. About 81.25% proceeded to theatre and the results of biopsies were carcinoma in 30.46%, laryngeal tuberculosis in 30.77% and chronic non specific laryngitis in 38.46%. The negative cases presented with Globus pharyngeus (57.1%), foreign body in the throat (28.6%) and Dysphagia (14.3%). It is concluded that Mirror Laryngoscopy remains a very useful procedure and there needs to be a deliberate effort to prevent it from slipping into obscurity. It confirms a direct correlation between hoarseness and laryngeal disease; its done most commonly in the 4th decade and more frequently pre-thyroidectomy than for laryngeal disease. Generally, it is done more commonly in females and may not be necessary pre-thyroidectomy except there are specific indications.

Key words: Mirror laryngoscopy, indirect laryngoscopy, indications, laryngeal disease, pharyngeal disease, hoarseness, pre-thyroidectomy

INTRODUCTION

Visualization of the pharynx and larynx is an essential part of a complete head and neck examination. However, it has not always been possible to examine these parts with the ease with which it is done today. Direct visualization, *in vivo*, is difficult because of the location of the larynx and pharynx and so was not possible until technology paved way for it and thereby for the speciality of laryngology. This breakthrough was made possible by the development of the laryngeal mirror, which made it possible to examine the living larynx in an awake and cooperative patient. It also set the stage for further progress in instrumentation that advanced the field of laryngology to its present state (Blitzer, 1998).

The earliest record of visualization of the larynx is that of Manuel Patricio Rodriguez Garcia (Manuel Garcia II), singer, music educator and pedagogist, who visualized his vocal cords in a barber's shop through a set of mirrors placed on the wall. In 1854, he published observations of his own larynx and vocal cords made with a small dental mirror introduced into the throat and using sunlight

reflected by another mirror. Garcia was interested in movements of the cord connected with singing and not in medicine. Nonetheless, the University of Konigsberg conferred upon him an honorary MD for his groundbreaking research (Mackinlay, 1908). In 1867 Labordette, a French physician published works in which he used a similar instrument, a modified speculum with a mirror to visualize the larynx so as to be able to intubate and resuscitate drowned and strangled patients.

With the mirror laryngoscope as the foundation, the evolution of laryngology has continued with the development of improved methods of observing the larynx and even the capacity to record laryngeal movement with video technology. Techniques of flexible and rigid endoscopy were developed, which not only improved visualization but also enabled stroboscopic evaluation of vocal cord vibrations, high speed photography, video-laryngoscopy and dynamic voice evaluation in an awake, cooperative patient (Blitzer, 1998).

Even though the terms mirror laryngoscopy and indirect laryngoscopy are often used interchangeably, indirect laryngoscopy actually encompasses both mirror

laryngoscopy and flexible fibre optic laryngoscopy both of which presents the observer with mirror images of the larynx and pharynx. Rigid laryngoscopy even though also used in the office setting is excluded, being a telescopic visualization (Holsinger *et al.*, 2008).

The basic procedure of mirror laryngoscopy still retains its very important place and this, despite technological advances, difficulty of learning and teaching the procedure, the fact that often only brief glimpses of the larynx can be obtained, in many patients anatomy or hyperactive gag reflexes preclude examination, children are unable to cooperate (Simpson and Rosen, 2008) and the patient's tolerance and compliance may limit the extent of the examination (Hartnick and Zeitels, 2005). The reasons for this are clear. They include the simplicity, low cost and possibility of use of the instrument anywhere and the need for otolaryngologist in training to have a grasp of this simple yet basic and important procedure.

This study explores the use of mirror laryngoscopy in a teaching hospital in semi urban Osogbo, Nigeria. It analyzes the indications, patient characteristics and the role it played in the management of the patient for whom it was used.

MATERIALS AND METHODS

This is a retrospective study of forty three consecutive mirror laryngoscopies performed by otolaryngologists on patients seen in the otolaryngology clinic of the Ladoke Akintola University of Technology Teaching Hospital, Osogbo, Nigeria. All mirror laryngoscopies had been done by consultant otorhinolaryngologists and the data extracted from the patients' clinical records as found in their case files.

Extracted data included; bio data (age and sex), presenting symptoms or indications for the mirror laryngoscopy, findings at laryngoscopy and outcome after laryngoscopy.

RESULTS AND DISCUSSION

A total of 43 mirror laryngoscopies were studied. The overall distribution of the indications is shown in Fig. 1. The commonest indication was preoperative evaluation for thyroidectomy (20 cases = 46.5%). Other indications, in the order of frequency, were: Hoarseness (16 cases = 37.2%), Globus pharyngeus (4 cases = 9.3%), Foreign bodies in the throat (2 cases = 4.7%) and Dysphagia (1 case = 2.3%).

Figure 2 shows the distribution of the indications in 2 groups namely pre-operative evaluation for thyroidectomy (20 cases -46.5%) and other indications (23 cases -54.5%).

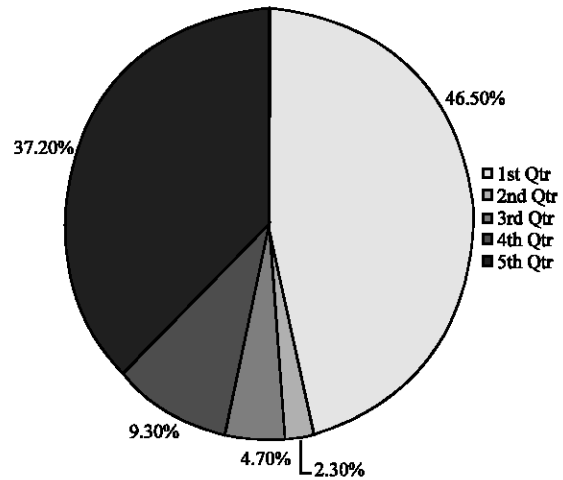


Fig. 1: Distribution of indications I (1st Qtr) Pre op evaluation for thyroidectomy (2nd Qtr) Hoarseness (3rd Qtr) Globus Pharyngeus (4th Qtr) Foreign Bodies (5th Qtr) Dysphagia

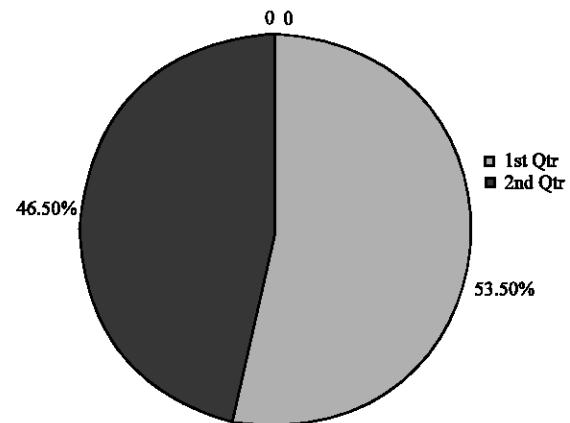


Fig. 2: Distribution of indications II. A (1st Qtr) Pre Op evaluation for thyroidectomy, B (2nd Qtr) other indications

Figure 3 shows the distribution of the other specific indications as proportions of indications apart from pre-operative evaluation for thyroidectomy. Of these, hoarseness was the commonest, accounting for 69.6% of that group. Globus pharygeus, foreign bodies and dysphagia accounted for 17.4, 8.7 and 4.3%, respectively.

Table 1 shows the overall age-sex distribution for the study. The age range is 24-75, age group 30-39 being the modal age group (32.6% of cases). Female of age group 30-39 were also most represented (32.56%) of total number of cases of the 43 cases, 17 were males (39.5%) and 26 were female (60.5%) giving an m:f ratio of 1:1.5.

Table 2 shows the age-sex distribution for the group that had mirror laryngoscopies done pre-thyroid surgery.

Of the 20, 16 (80%) were female and only 4 (20%) were male. Here also, age group 30-39 was the modal group being responsible for 30% of the cases.

Table 3 shows the age-sex distribution for the patients who had IDL done for other indications besides thyroid surgery. Here also the age group 30-39 is the modal age group (34.8% of cases). However, there were more males (56.5%) in this group than females (43.5%).

Of the 20 cases that we done pre-thyroidectomy, there were normal findings in 19 (95%). In only one case (5%) was there abnormal findings (Fig. 4). This solitary case however, also presented with hoarseness and had laryngoscopy findings suggestive of chronic laryngitis and was confirmed by histology as chronic non specific laryngitis.

Among the group comprising the 23 cases of IDL done for other indications, there were positive findings in 16 (69.6) and negative findings in 7 (30.4%).

Laryngeal masses were noted in 8 cases (50%). Hyperaemia and indurations suggestive of inflammation in 5 cases (31.25%), Singers nodes in 2 cases (12.5) and Vocal Cord Paralysis in 1 case (6.25%).

Figure 5 shows the distribution of the various diagnoses found for the positive findings in Fig. 6.

These were essentially all those who presented with hoarseness.

Figure 7 shows the distribution of the indications for the negative findings. The group includes such

indications as Globus pharyngeus (4 cases-57.1%), foreign body in the throat (2 cases-28.6%) and Dysphagia (1 case-14.3%).

In the positive findings group, 16 in 20 (all the cases presenting with hoarseness) 13 (81.25%) proceeded to theatre the other three having had established diagnoses of singer' nodes (2) and vocal cord paralysis 2° to thyroidectomy (1) results yielded (carcinoma) in 4 (30.46%), laryngeal tuberculosis in 4 (30.77%) and chronic non specific laryngitis in 5 (38.46%) (Fig. 8).

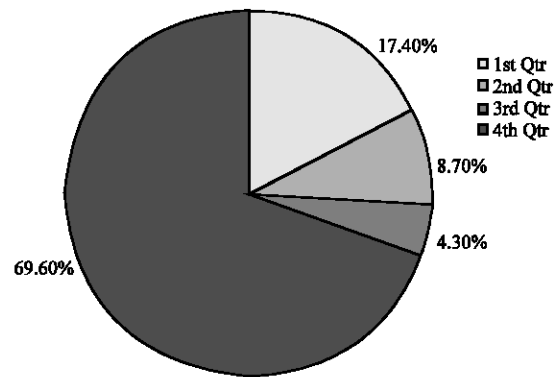


Fig. 3: Distribution of other specific indications (1st Qtr) Hoarseness (2nd Qtr) Globus Pharyngeus (3rd Qtr) Foreign Bodies (4th Qtr) Dysphagia

Table 1: Overall age-sex distribution

Age group	M	Within group (M%)	Total (%)	F	Within group (F%)	Total (%)	Total	Overall total (%)
20-29	1	5.88	2.33	5	19.23	11.63	6	13.96
30-39	5	29.41	11.63	9	34.61	20.93	14	32.56
40-49	5	29.41	11.63	5	19.23	11.63	10	23.26
50-59	1	5.88	2.33	3	11.54	6.98	4	9.31
60-69	3	17.65	6.98	4	15.38	9.30	7	16.28
70-79	2	11.76	4.65	-	-	-	2	4.65
	17	-	-	26	-	-	43	-

Table 2: Age-sex distribution for mirror laryngoscopy done-pre-thyroid surgery

Age group	M	Within group (M%)	Total (%)	F	Within group (F%)	Total (%)	Total	Overall total (%)
20-29	1	25.00	5.00	2	12.50	10.00	3	15.00
30-39	1	25.00	5.00	5	31.25	25.00	6	30.00
40-49	1	25.00	5.00	3	18.75	15.00	4	20.00
50-59	-	-	-	2	12.50	10.00	2	10.00
60-69	-	-	-	4	25.00	20.00	4	20.00
70-79	1	25.00	5.00	-	-	-	1	5.00
	4	-	-	16	-	-	20	-

Table 3: Age-sex distribution for other indications (besides pre-thyroidectomy)

Age group	M	Within group (M%)	Total (%)	F	Within group (F%)	Total (%)	Total	Overall total (%)
20-29	-	-	-	3	30.00	13.04	3	13.04
30-39	4	30.77	17.39	4	40.00	17.39	8	34.78
40-49	4	30.77	17.39	2	20.00	8.70	6	26.09
50-59	1	7.69	4.35	1	10.00	4.35	2	8.70
60-69	3	23.08	13.04	-	-	-	3	13.04
70-79	1	7.69	4.35	-	-	-	1	4.35
	13	-	-	10	-	-	23	-

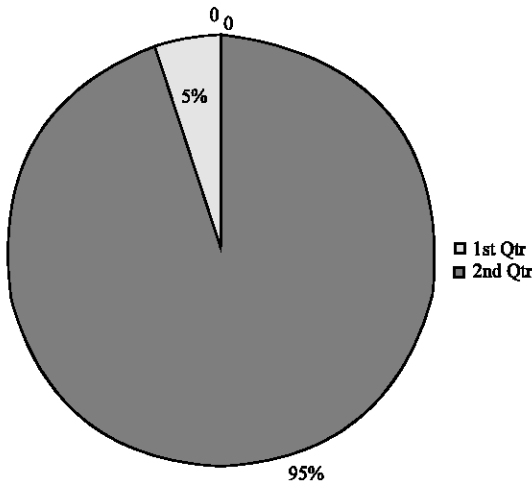


Fig. 4: Findings at Laryngoscopy for Pre-thyroidectomy Mirror Laryngoscopy 1st Qtr: Normal findings, 2nd Qtr: Chronic laryngitis

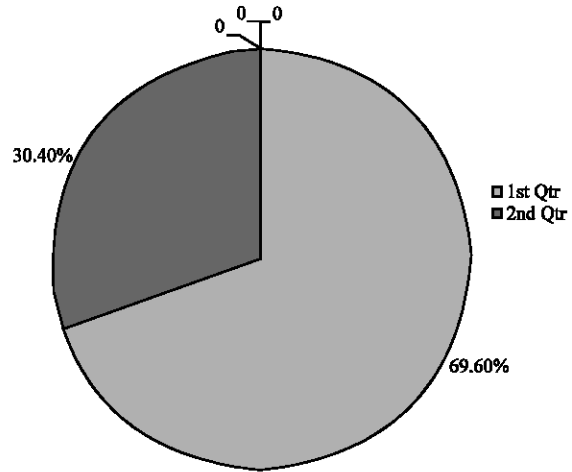


Fig. 6: Findings at Laryngoscopy among non pre-thyroidectomy Mirror Laryngoscopies, 1st Qtr: Positive findings; 2nd Qtr: Normal findings

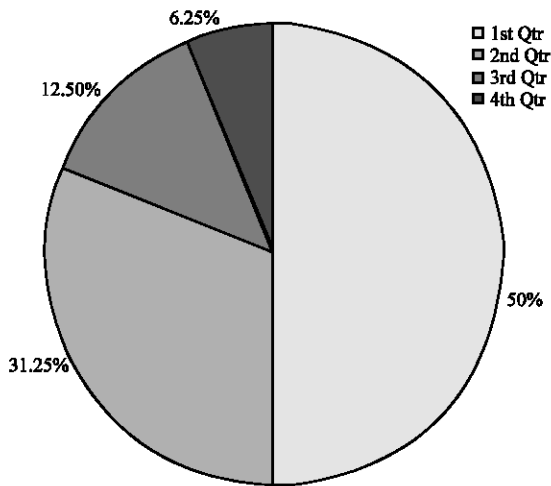


Fig. 5: Distribution of the diagnoses for positive findings. 1st Qtr: Masses; 2nd Qtr: Inflammatory changes; 3rd Qtr: Singers nodes; 4th Qtr: Vocal cord paralysis

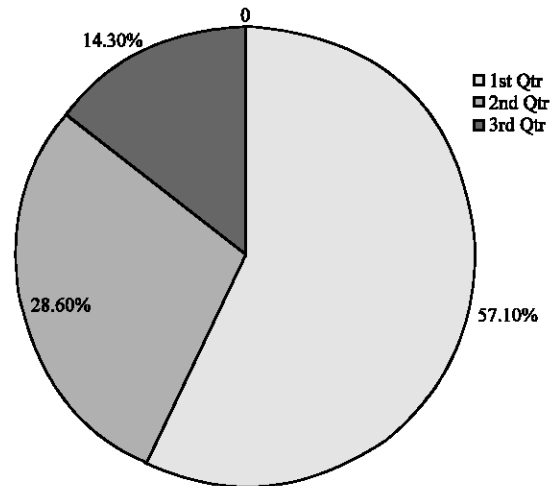


Fig. 7: Indications that yielded negative results; 1st Qtr: Globus pharyngens; 2nd Qtr: Foreign bodies in the throat; 3rd Qtr: Dysphagic

Mirror laryngoscopy has retained its key place in the evaluation of the larynx and pharynx, not only in the otolaryngologist's office but also increasingly in a number of other specialties (Siker, 1956).

As is demonstrated in this series the importance of the procedure lies in a normally inaccessible part of the body. This is even more important when potentially life threatening illnesses can be diagnosed early. Of the 43 cases in our series, 8 (18.6%) turned out to have potentially life threatening diagnoses. A 4 (9.3%) cases of laryngeal malignancy and 4 (9.3%) of laryngeal tuberculosis. The significance leaps more to the eyes

when one considers that these were eight of the 23 with specific symptoms suggesting pharyngeal or laryngeal disease a whopping 34.8%.

Also significant is the fact that mirror laryngoscopy excluded laryngeal disease in seven, yielding only positive findings in all patients who presented with hoarseness. Thus, the correlation noticed between hoarseness and laryngeal disease is confirmed by mirror laryngoscopy. The implication is that a negative mirror laryngoscopy finding is very significant being a pertinent Negative strongly suggestive of the absence of supraglottic laryngeal disease.

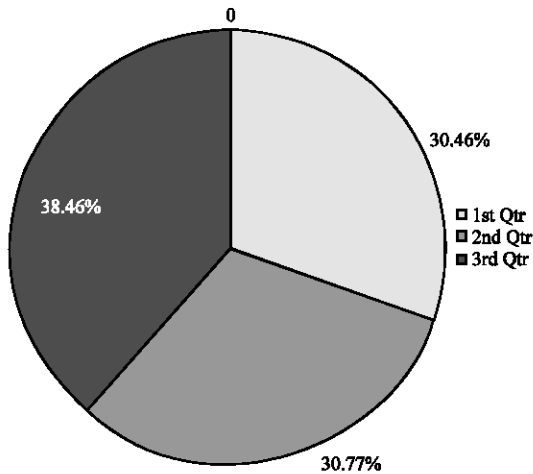


Fig. 8: Theatre findings; 1st Qtr: Carcinoma, 2nd Qtr: Tuberculosis, 3rd Qtr: Chronic non specific laryngitis

Common indications for laryngoscopy include chronic cough, laryngotracheal dyspnoea, dysphonia, voice changes, chronic throat pain, persistent otalgia, swallowing problems, dysphagia and symptoms of aspiration (King *et al.*, 2007; Ridley *et al.*, 1996). Here, we observed pre operative preparation for thyroidectomy, hoarseness, globus pharyngeus (feeling of a mass in the throat), foreign bodies in the throat and dysphagia as the indications. We did not find the commonest indication documented anywhere in literature. Our series suggests that the commonest indication is pre-operative preparation for thyroidectomy (i.e., to investigate the state of the larynx pre-operatively) accounting for almost half (46.5%) of all cases seen. The next common indication was hoarseness (37.2%). Hoarseness however, is the commonest indication for symptoms ($\frac{16}{23}$) (69.6%). This is understandable because the vast majority of laryngeal disease present with hoarseness. It is also interesting to note that mirror laryngoscopy is done more frequently for pre-thyroid surgery than to investigate laryngeal disease. Is this difference statistically significant? Larger and prospective studies are needed to answer the question.

Other indications were non laryngeal-dysphagia, foreign body and globus pharyngeus, confirming the place of mirror laryngoscopy not only in investigating laryngeal disease but also for pharyngeal and oesophageal disease. Other common indications for mirror laryngoscopy are not found in this study because of the small sample size.

The age range of 24-75 found in this study suggests that mirror laryngoscopy is done at all adult ages. It may also be a reflection of the fact that the indications for the procedure are present in all adult age groups, another fact that needs the weight of a large prospective study.

While all age groups are represented it is noteworthy that the most represented age group in this study is age group 30-39. This age group remains the most populous for all the various categories of the study population, whether it is the whole group, the pre-thyroid surgery group or the non pre-thyroid surgery group. This clustering strongly suggests that the commonest age group for which mirror laryngoscopy is done is age group 30-39, the indications notwithstanding. The least represented age group is age group 70-79 representing only 4.65%. The cases in this group were however, confirmed to be malignancy. This underscores the fact that the investigation is extremely useful in that age group even if it is less frequently used.

The sex distribution in this study is quite interesting and it helps outline some facts. Before correcting for the various indications it is noted that the overall m:f ratio was 1:1.5. Clearly, the procedure is done 1.5 times more often in females than in males. But that is not the whole picture. When we correct for indications, it is seen that while the m:f ratio shows more female preponderance at 1:4 in Mirror Laryngoscopy done for preparation for thyroid surgery, for other indications there is a slight male preponderance (m:f ratio = 1.3:1). Larger studies need to be done to corroborate or refute this pattern.

Finally, we must not overlook the result pattern for the mirror laryngoscopies done as part of preparation for thyroid surgery. Of the 20 only 1 (5%) yielded positive results suggestive of Chronic Laryngitis. But this patient also presented with hoarseness. Therefore, if we consider the cases that presented strictly for pre-thyroidectomy assessment without other indications we have a 100% with no positive findings. Thus, it can be argued that if there are no other symptoms and signs to suggest laryngeal disease and such can be clearly documented, it may be more time and cost effective to skip mirror laryngoscopy as part of pre-thyroidectomy assessment. It is interesting to note however that one of the hoarseness cases in this study was eventually diagnosed as a case of Vocal Cord Paralysis following Thyroidectomy. Thus, for medico legal reasons some form of objective voice and laryngeal function assessment is important prior to thyroidectomy, though this may not necessarily be a mirror laryngoscopy.

CONCLUSION

Mirror Laryngoscopy is a common procedure in otorhinolaryngology. Its development was a landmark event in the specialty of laryngology and paved the way for the many developments we have today. Rather than fade into history and obscurity, it has stood the test of time, retaining its very important place in the practice of laryngology. However, with the current explosion of technology, the possibility of extinction of the procedure is very real.

Therefore, there needs to be a deliberate concerted effort to prevent this very important procedure from slipping into obscurity. Other conclusions this study helps reach include: mirror laryngoscopy is of great value in assessment of patients who present with suspected laryngeal disease, thyroid disease and pharyngeal disease. It confirms a direct correlation between hoarseness and laryngeal disease. It is done most commonly in the fourth decade and more frequently for preoperative assessment for thyroidectomy than for laryngeal disease. Generally, it is done more commonly in females except when one is considering only suspected laryngeal disease and it may not be necessary for preoperative assessment for thyroidectomy except there are specific indications.

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