INTRODUCTION:
An Anaesthesiologist should secure the airway during induction, maintenance of anaesthesia and recovery from anaesthesia. The Macintosh blade is one of the most popular blades with a gentle curved tongue which extends to the tip. McCoy is based on the standard Macintosh blade which has a hinged tip and operated by a lever mechanism on the back of the handle. 

Aim: An attempt has been made to compare the Macintosh and McCoy blade for the glottic visualization, with regard to the difference in the ease of intubation. 

Method: Institutional Ethics Committee approval was taken prior to commencement of study. An informed and written consent was taken from every patient selected for the study. 60 adults (18 – 60 years) of both sexes, ASA Grade I & II, undergoing elective surgery under general anaesthesia requiring endotracheal intubation were enrolled in this study. Using computer generated random allocation chart, patients were randomly allocated to one of the two groups depending upon the types of laryngoscope blade was used during intubation. After induction of anaesthesia laryngoscopy was performed and trachea was intubated. Group A – where McCoy Laryngoscope blade was used, Group B – where Macintosh Laryngoscope blade was used. Cormack Lehane grading, number of attempts, intubation difficulty score and need for external laryngeal manipulation were assessed. Statistical Analysis: Statistical analysis was done by using SPSS. Student t-Test, chi square test were applied according to the requirement. The level of significance was fixed at 95%. P<0.05 was considered as statistically significant. 

Results: Cormack Lehane Grade 1 view was obtained by group A and group B are 80% and 66.7% respectively, where grade 2 view obtained by group A & group B are 20% and 26.7% respectively (p <0.05). Intubation difficulty score (IDS) grade 1 in group A and group B are 93.3% and 86.7% respectively, where IDS grade 2 in group A and group B are 6.7% and 10% respectively (p > 0.05), 26.7% patients from group B needed external laryngeal manipulation where no patient from group A needed it which is statistically significant (p <0.05).

Conclusion: There is no significant change in glottic visualization with McCoy and Macintosh laryngoscope but as far as external laryngeal manipulation is concerned, McCoy laryngoscope is better than the Macintosh laryngoscope for the ease of intubation.

In this study, an attempt has been made to compare the Macintosh and McCoy blade for the glottic visualization, with regard to the difference in the ease of intubation.

METHODOLOGY:
Institutional Ethics Committee approval was taken prior to commencement of study. An informed and written consent was taken from every patient selected for the study. 60 adults (18 – 60 years) of both sexes, ASA Grade I & II, undergoing elective surgery under general anaesthesia requiring endotracheal intubation were enrolled in this study. Patients with anticipated difficult intubation, NBM status <8 hours, Obese patients (BMI > 30), Oro-pharyngeal surgery were excluded from the study. Using computer generated random allocation chart, patients were randomly allocated to one of the two groups depending upon the types of laryngoscope blade was used during intubation. Group A – where McCoy Laryngoscope blade was used, Group B – where Macintosh Laryngoscope blade was used.

A detailed routine pre-anaesthetic check up was done in the pre-anaesthesia check-up clinic; where airway was assessed using Samsung and Young’s modification of the Mallampati classification, inter-incisor gap and adequacy of neck movements. All the routine laboratory investigations were checked.

Samsung and Young’s modification of the Mallampati classification
Class I: Soft palate, faucial pillars, uvula visible
Class II: Soft palate, uvula visible
Class III: Soft palate and base of uvula or none visible
Class IV: Only hard palate visible.

In the OT, pulse oximeter, ECG, capnography and automated non-invasive blood pressure were attached for monitoring and intravenous access was secured using 20 G IV cannula and an infusion of dextrose normal saline (DNS) was started slowly. Demographic data such as age, sex and weight of the patient was noted.

A Doughnut-shaped pillow was placed under the head of the patient to obtain classical sniffing position. The patient was pre-medicated by inj. glycopyrrolate (0.2mg), inj. midazolam (1mg), inj. ondensonron (4mg) and inj. pentazocin (0.3mg/kg) intravenously. The patient was pre-oxygenated with 100% oxygen for 3 min. Then Anaesthesia was induced with 2 mg/kg of propofol. Feasibility of ventilation with a face mask was checked prior to injection of depolarising muscle relaxant. After ventilation is confirmed inj. succinylcholine 2 mg/kg was administered and the patient was ventilated with 100% Oxygen. The laryngoscopy and intubation were carried out in classical intubating position by a single, trained anaesthesiologist. We studied following aspects during tracheal intubation.

1. **Visualisation of laryngeal inlet: This was graded using Cormack Lehane (CL) Grades:**

   Grade 1: Complete glottis visible
   Grade 2: Anterior glottis not seen
   Grade 3: Epiglottis seen but not glottis
   Grade 4: Epiglottis not seen.

   If the view after laryngoscopy was more than CL Grade 2 external laryngeal manipulation was carried out.

2. **Ease of intubation: This was graded as follows:**

   Grade 1: Intubation easy
   Grade 2: Intubation requiring an increased anterior lifting force and assistance to pull the right corner of the mouth upwards to increase space
   Grade 3: Intubation requiring multiple attempts and a curved stylet
   Grade 4: Failure to intubate with the assigned laryngoscope.

3. **The need for external manipulation was classified as:**

   Grade 1: No requirement of external laryngeal manipulations
   Grade 2: Requirement of external laryngeal manipulation

   Number of attempts was noted. Patients was ventilated with 100% oxygen between attempts at laryngoscopy and intubation so that no patient was allowed to desaturate below 95%. After 2 attempts at intubation with assigned blade, patients was intubated by senior anaesthesiologist using Macintosh laryngoscope.

**STATISTICAL ANALYSIS:**

Statistical analysis was done by using SPSS. Student t-Test, chi square test were applied according to the requirement. The level of significance was fixed at 95%. P<0.05 was considered as statistically significant.

**RESULTS:**

Both the groups were comparable with regards to age, gender, weight, height, ASA physical status and MPC grading and there was no statistically significant difference among the two groups (p value >0.05), (Table 1). Cormack Lehane Grade 1 view was obtained by group A and group B are 80% and 66.7% respectively, where grade 2 view obtained by group A & group B are 20% and 26.7% respectively, which is statistically insignificant (p > 0.05), (Table 2), (Figure 1).

Intubation difficulty score (IDS) grade 1 in group A and group B are 93.3% and 86.7% respectively; where IDS grade 2 in group A and group B are 6.7% and 10% respectively, which is statistically not significant (p > 0.05), (Table 3), (Figure 2). 3.3% patient from group A and 13.3% patients from group B, needed two attempts at intubation respectively which is statistically not significant (p> 0.05), (Table 4), (Figure 3). 26.7% patients from group B needed external laryngeal manipulation where no patient from group A needed it which is statistically significant (p <0.05), (Table 5), (Figure 4).

**Table 1: Demographic Data, ASA grading, MPC grading in – Group ‘A’ and Group ‘B’**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A (n=30)</th>
<th>Group B (n=30)</th>
<th>Total (% )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>47.1 (9)</td>
<td>48.5 (8.5)</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Sex (Male: Female)</td>
<td>13:17</td>
<td>14:16</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>167 (8.3)</td>
<td>169 (7.7)</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>58 (8.6)</td>
<td>59.7 (7.2)</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>ASA grading (I:II)</td>
<td>23.7</td>
<td>24.6</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>MPC grading (1:2)</td>
<td>18:12</td>
<td>20:10</td>
<td>&gt; 0.05</td>
</tr>
</tbody>
</table>

Fisher exact Test was applied. P value was 0.38 (statistically not significant).

**Figure 1: Bar diagram showing CL grading of patients in group ‘A’ and group ‘B’**

**Table 3: Intubation difficulty Score of patients in group ‘A’ and group ‘B’.**

<table>
<thead>
<tr>
<th>Intubation difficulty Score</th>
<th>Group A (%)</th>
<th>Group B (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>28 (93.3)</td>
<td>26 (86.7)</td>
<td>54 (90)</td>
</tr>
<tr>
<td>Grade 2</td>
<td>2 (6.7)</td>
<td>3 (10)</td>
<td>5 (8.3)</td>
</tr>
<tr>
<td>Grade 3</td>
<td>___</td>
<td>1 (3.3)</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Total</td>
<td>30 (100)</td>
<td>30 (100)</td>
<td>60 (100)</td>
</tr>
</tbody>
</table>

Fisher Exact Test was applied. P value was 0.83 (statistically not significant)
DISCUSSION:

With the Macintosh blade, the curvature of the blade acts as a visual “hill,” interrupting the line of sight, called the “Crest of the Hill” effect. When Macintosh blade is used the tongue should be displaced more into the submandibular space. With Macintosh blade, the oral axis makes an angle with the laryngeal axis, masking the glottis as it is covered by the epiglottis and this interferes with glottic view. When the McCoy blade is used, the epiglottis is lifted out of the way improving glottic exposure. Thus, the force required is reduced as the tongue only needs to be displaced laterally. There are some studies which showed that McCoy blade as well as external laryngeal manipulation are effective in cases of difficult intubation.

Uchida et al. conducted a study and found that when laryngoscopy was performed with neck in neutral position the grade of glottic view improved with use of McCoy blade from Grade 2 to 3 views obtained with Macintosh blade. In a study conducted by Bito et al found that the views obtained with McCoy blade were the best (82 Grade I views) while Grade I view was obtained in least number of patients (47 Grade Views) with the Macintosh blade. Arino et al found that the levering tip of the McCoy blade significantly improved the laryngoscopic view (87/100 Grade I views) when it was compared to Macintosh blade (72/100 Grade I views).

In a study conducted by Atul P Kulkarni, Amar S Tirmanwar in may 2013, they compared between different laryngoscopy blades regarding comparision of glottis visualization and ease of intubation. They find out CL grade 1 view was obtained in 77% of patient by McCoy blade and 63% of patient by Macintosh blade. They also noted that view of glottis is interrupted by epiglottis when macintosh blade is used. But McCoy blade improves the glottis exposure and force required is reduced as the tongue only needs to be displaced laterally.

We found that CL Grade I and Grade II of glottic visualisation were obtained in 80% and 20% of patients respectively with McCoy blade whereas with Macintosh blade CL Grade I, Grade II and Grade III view were obtained in 66.7%, 26.7% and 6.6% of patients respectively (p> 0.05).

CONCLUSION:

There is no significant change in glottic visualization with McCoy and Macintosh laryngoscope but as far as external laryngeal manipulation is concerned McCoy laryngoscope is better than the Macintosh laryngoscope for the ease of intubation.

REFERENCE:

2. Levitan RM, Kinkle WC, Levin WJ, Everett WW. Laryngeal view during laryngoscopy;


5. Kulkarni AP, Tirmamwar AS. Comparison of glottis visualisation and ease of intubation with different laryngoscope blades. Indian J Anaesth 2013;57:170-4


