

# Comparative Evaluation of Ease of Operator and Patient Acceptability Using the Traditional Isolation System vs a New Isolation Tool (Intraoral Cheek and Lip Retractor Mouth Opener Tool)

Keyur M Chauhan<sup>1</sup>, Vasudha Sodani<sup>2</sup>, Devdatt J Sharma<sup>3</sup>, Harsh H Solanki<sup>4</sup>, Reetu D Shah<sup>5</sup>, Vaishnavi R Agarwal<sup>6</sup>

## ABSTRACT

Isolation plays an important role in dentistry. It is mandatory to maintain isolation during various dental treatments. A simple new isolation tool (intraoral cheek and lip retractor mouth opener tool) is available, which is a multipurpose tool. The need for the study was to evaluate the functionality of the new isolation tool.

**Aim:** The aim of the study was to compare the traditional isolation method with the new isolation tool. A questionnaire pattern was adopted for the present study. The study was then conducted to evaluate the patient acceptability and ease of access for the operator.

**Materials and methods:** A total 200 pediatric patients were included in the study; they were divided into two groups. Group I— isolation with the new isolation tool, group II— isolation with cotton rolls and a mouth mirror. A structured questionnaire was given to the operators to evaluate the ease of use of the new isolation tool. A Likert scale was provided to the patients to evaluate the comfort of the new isolation tool during various treatments.

**Result:** Statistical analysis shows significant results by obtaining the  $p$ -value  $< 0.05$ .

**Conclusion:** The study clearly shows that the new isolation tool is a better option in terms of retracting soft tissue, keeping the mouth open, and maintaining isolation.

**Clinical significance:** This new tool helps in the retraction of soft tissue as well as isolation, and it also keeps the mouth open.

**Keywords:** Ease of operator, Isolation, New isolation tool, Patient acceptability.

*International Journal of Clinical Pediatric Dentistry* (2024): 10.5005/jp-journals-10005-2854

## INTRODUCTION

All surgical interventions require sufficient space above the surgical field. Proper humidity control, good accessibility and visibility, and sufficient space for instrumentation around the work area are required. This type of environment is necessary for easy operation. Work area isolation includes isolation of saliva, blood, periodontal fluid, and soft tissues such as lips, cheeks, gums, and tongue.<sup>1</sup>

Surgical field isolation is a fundamental aspect of pediatric dentistry. The complexity of the oral environment poses many obstacles to the performance of dental procedures. To minimize these, the surgical field must be controlled. Adequate isolation is necessary to ensure safety and quality of care. Moreover, good isolation is an important prerequisite for ensuring long-term continuity of dental care.<sup>2</sup>

Anxiety and fear resulting from previous traumatic experiences at the dental office or hospitalization for general health problems can cause emotional turmoil for most children.<sup>3</sup>

Therefore, pediatric dentists should maintain a friendly relationship with children to reduce their fear and anxiety about dental treatment.<sup>4</sup> By prioritizing the treatment preferences of children, dental phobias and anxiety can be addressed.<sup>5</sup>

Isolation plays an important role in pediatric patients due to their increased salivation and excessive tongue movement. It's mandatory to maintain isolation during various dental treatments. Generally, traditional isolation is achieved using cotton rolls and a mouth mirror. A simple new isolation tool

<sup>1-6</sup>Department of Pedodontics and Preventive Dentistry, Ahmedabad Dental College & Hospital, Ahmedabad, Gujarat, India

**Corresponding Author:** Keyur M Chauhan, Department of Pedodontics and Preventive Dentistry, Ahmedabad Dental College & Hospital, Ahmedabad, Gujarat, India, Phone: +91 9925997778, e-mail: keyurm16@gmail.com

**How to cite this article:** Chauhan KM, Sodani V, Sharma DJ, *et al.* Comparative Evaluation of Ease of Operator and Patient Acceptability Using the Traditional Isolation System vs a New Isolation Tool (Intraoral Cheek and Lip Retractor Mouth Opener Tool). *Int J Clin Pediatr Dent* 2024;17(6):637–640.

**Source of support:** Nil

**Conflict of interest:** None

(intraoral cheek and lip retractor mouth opener tool) is available, which is a multipurpose tool used to maintain isolation, retract soft tissue, and keep the mouth open. The aim of the study was to compare the traditional isolation method with the intraoral cheek and lip retractor mouth opener tool. The objectives were to compare patient acceptability and evaluate the ease of access for the operator.

## MATERIALS AND METHODS

Materials used for the study included cotton rolls, a mouth mirror, and the intraoral cheek and lip retractor mouth opener tool. A total of 200 pediatric patients were selected as the sample population

and divided into two groups of 100 patients each. Group I underwent isolation using the new isolation tool (intraoral cheek and lip retractor mouth opener tool), while group II underwent isolation using cotton rolls and a mouth mirror. Operators were given a structured questionnaire to evaluate the ease of using the new isolation tool and to compare it with the traditional method. Patients were assessed using a Likert scale to evaluate the comfort of the new isolation tool during dental treatments. The questionnaire consisted of five questions.

The questionnaire form includes:

- Time is taken for placement of tool/cotton roll:
  - <2 minutes
  - 2–4 minutes
  - 4–6 minutes
  - >6 minutes
- Difficulty faced during placement of the tool/cotton roll:
  - Easy
  - Medium
  - Hard
- Ease of removal of the tool/cotton roll after treatment:
  - Easy
  - Medium
  - Hard
- Problem faced during placement of the tool/cotton roll:
  - Stable
  - Partially stable
  - Unstable
- Ease of operating:
  - Excellent
  - Good
  - Poor

Likert scale was given to the patients to evaluate comfort:

- 1—Awful
- 2—Not very good
- 3—Okay
- 4—Really good
- 5—Fantastic

## RESULTS

In this study, Chi-squared tests were performed to obtain *p*-values and results. Based on the operators' responses, cross-tabulations and the Chi-squared test tables and graphs were created.

For the first question regarding the time taken for the placement of the tool/cotton roll out of 200 responses from group I, 63 operators selected option (a) <2 minutes, 23 operators selected option (b) 2–4 minutes and 14 operators selected option (c) 4–6 minutes, none of the operators selected option (d) >6 minutes. From group II, 89 operators selected option (a)

<2 minutes, 11 operators selected option (b) 2–4 minutes. None of the operators selected option (c) 4–6 minutes and option (d) >6 minutes. According to the Pearson's Chi-squared test, the *p*-value for the first question is <0.05, which showed a highly significant result (Table 1).

For the second question regarding difficulty faced during placement of tool/cotton roll out of 200 responses from group I, 74 operators selected option (a) easy, 23 operators selected option (b) medium, and 3 operators selected option (c) hard. From group II, 93 operators selected option (a) easy, 7 operators selected option (b) medium, and none of the operators selected option (c) hard. According to the Pearson's Chi-squared test, the *p*-value for the second question is <0.05, which showed a significant result (Table 2).

For the third question regarding ease of removal of the tool/cotton roll after treatment, out of 200 responses from group I, 86 operators selected option (a) easy, 9 operators selected option (b) medium and 5 operators selected option (c) hard. From group II, 92 operators selected option (a) easy, 8 operators selected option (b) medium, and none of the operator selected option (c) hard. According to the Pearson's Chi-squared test, the *p*-value for the third question is >0.05 which showed no significant result (Table 2).

For the fourth question regarding the problem faced with the tool/cotton roll during placement, out of 200 responses from group I, 49 operators selected option (a) stable, 37 operators selected option (b) partially stable and 14 operators selected option (c) unstable. From group II, 18 operators selected option (a) stable, 75 operators selected option (b) partially stable, and 7 operators selected option (c) unstable. According to the Pearson's Chi-squared test, the *p*-value for the fourth question is <0.05, which showed a highly significant result (Table 3).

For the fifth question regarding ease of operating, out of 200 responses from group I, 66 operators selected option (a) excellent, 32 operators selected option (b) good and 2 operators selected option (c) poor. From group II, 24 operators selected option (a) excellent, 68 operators selected option (b) good and 8 operators selected option (c) poor. According to the Pearson's Chi-squared

**Table 1:** Time taken for the placement of tool/cotton roll

Time	Group I n (%)	Group II n (%)	<i>p</i> -value
<2 minutes	63 (63%)	89 (89%)	<0.001 <sup>Ⓜ</sup>
2–4 minutes	23 (23%)	11 (11%)	
4–6 minutes	14 (14%)	0 (0%)	
>6 minutes	0 (0%)	0 (0%)	

<sup>Ⓜ</sup>, *p*-value (<0.05 is significant); <sup>Ⓜ</sup>, Pearson's Chi-squared test

**Table 2:** Difficulty faced during placement and ease of removal of tool/cotton roll

	Difficulty faced during placement of the tool/cotton roll		Ease of removal of the tool/cotton roll after the treatment	
	Group I n (%)	Group II n (%)	Group I n (%)	Group II n (%)
Easy	74 (74%)	93 (93%)	86 (86%)	92 (92%)
Medium	23 (23%)	7 (7%)	9 (9%)	8 (8%)
Hard	3 (3%)	0 (0%)	5 (5%)	0 (0%)
<i>p</i> -value	0.001 <sup>Ⓜ</sup>		0.072 <sup>Ⓜ</sup>	

<sup>Ⓜ</sup>, *p*-value (<0.05 is significant); <sup>Ⓜ</sup>, Pearson's Chi-squared test

**Table 3:** Problem faced with the tool/cotton roll during placement

	Group I n (%)	Group II n (%)	<i>p</i> -value
Stable	49 (49%)	18 (18%)	<0.001 <sup>Ⓜ</sup>
Partially stable	37 (37%)	75 (75%)	
Unstable	14 (14%)	7 (7%)	

<sup>Ⓜ</sup>, *p*-value (<0.05 is significant); <sup>Ⓜ</sup>, Pearson's Chi-squared test

test, the  $p$ -value for the fifth question is  $<0.05$ , which showed a highly significant result (Table 4).

For the evaluation of the comfort of the patient, out of 200 responses from group I, 37 children selected a rating 3—okay, 60 children selected a rating 4—really good and 3 children selected a rating 5—fantastic. From group II, 75 children selected rating 3—okay, 23 children selected rating 4—really good. According to the Chi-squared test, the  $p$ -value is  $<0.05$ , which indicates that the results were highly significant.

## DISCUSSION

This study performed and validated a questionnaire to measure patient comfort and the ease of use for operators using the new isolation tool. Generally, isolation in dental procedures involves placing a cotton roll in the buccal and lingual vestibules, while cheek and tongue retraction is achieved with a mouth mirror. Cotton rolls play an important role in isolating saliva and gingival fluid but are limited in terms of soft tissue retraction. Various tools are available for isolation in the market, including rubber dams, cotton rolls, gauze pieces, absorbent wafers, the Isolite system,

and saliva ejectors. A new multipurpose tool, the intraoral cheek and lip retractor mouth opener tool, is now available. This tool facilitates cheek and lip retraction, keeps the mouth open, and aids in isolating oral fluids.

As per the aim of the study, a comparison was made between cotton rolls, mouth mirrors, and the new tool in terms of isolation and soft tissue retraction. The study involved 200 child patients who underwent various treatments such as restoration, root canal treatment, and pulpectomy procedures. Operators were given a detailed physical questionnaire to evaluate their preference for isolation tools. The questionnaire focused on the placement, stability during treatment, and removal of the tool or cotton roll after treatment.

It's mandatory to maintain proper isolation in children during treatment because they are very curious about what is going on in their mouth, resulting in excessive tongue movement. Proper retraction of the tongue is necessary to avoid any injury during treatment.

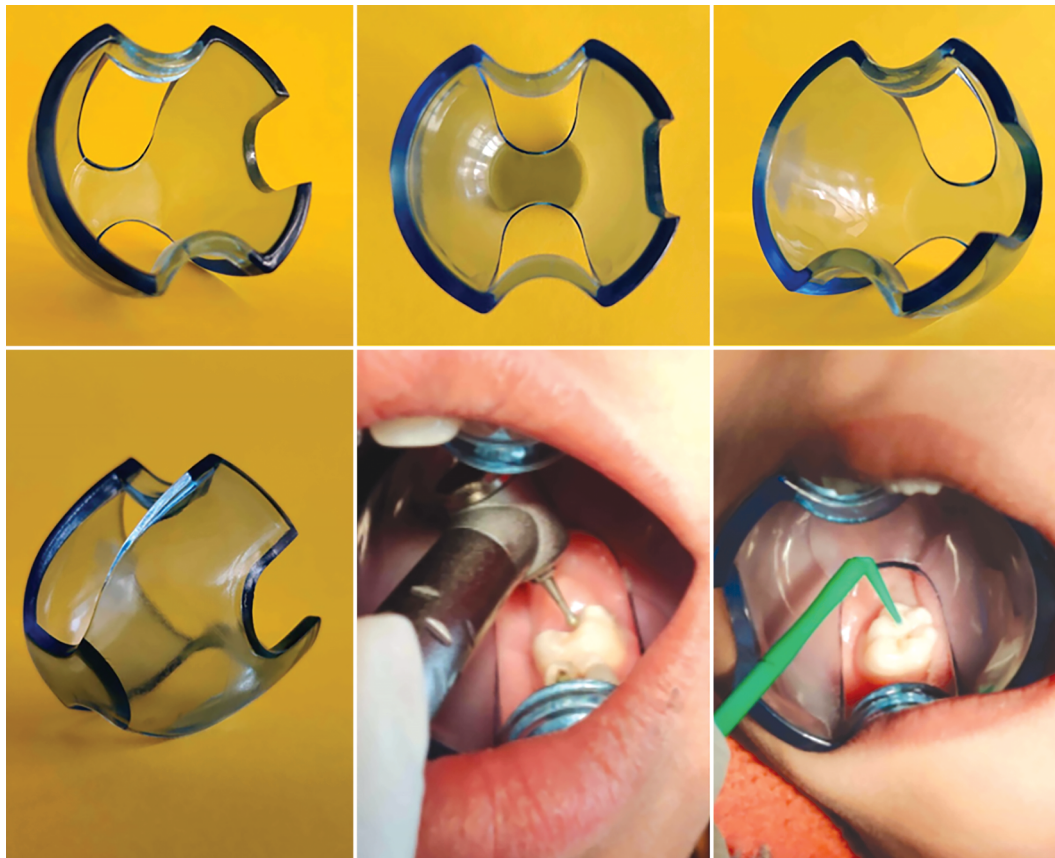
The tool is available in a ball shape with a diameter of 3 cm. It is offered in a universal size suitable for both child and adult patients. The tool provides better isolation and good accessibility. It can be sterilized by autoclave and is easy to use, placed similarly to a mouth block (Fig. 1).

Before treatment began, operators were given a questionnaire form to evaluate their responses toward the cotton roll and the intraoral cheek and lip retractor mouth opener tool. After recording these responses, a Likert scale was administered to the children to evaluate their responses toward treatment conducted under isolation with the cotton roll and mouth mirror, as well as

**Table 4:** Ease of operating

	Group I n (%)	Group II n (%)	$p$ -value
Excellent	66 (66%)	24 (24%)	$<0.001^{\Phi\mu}$
Good	32 (32%)	68 (68%)	
Poor	2 (2%)	8 (8%)	

$^{\Phi}$ ,  $p$ -value ( $<0.05$  is significant);  $^{\mu}$ , Pearson's Chi-squared test



**Fig. 1:** Intraoral cheek and lip retractor mouth opener tool

under isolation with the intraoral cheek and lip retractor mouth opener tool.

Based on the operators' and children's responses, the results were evaluated. The Pearson's Chi-squared test was conducted to determine the  $p$ -values. Based on the  $p$ -value of the operators' responses, the results were significant, particularly regarding ease of operation. Almost all operators found the new tool very useful, with a highly significant  $p$ -value ( $<0.001$ ) for this question. Similarly, for patient comfort during treatment, the  $p$ -value also showed a highly significant result.

Similar studies have been conducted previously. Behuria compared fluid absorbents, saliva ejectors, antisialagogues, and rubber dams for isolation purposes. Among these, they found that rubber dams were effective for isolation.<sup>1</sup> Ammann et al. found that stress levels among children and adolescents were lower with isolation using a rubber dam compared to isolation with cotton rolls.<sup>2</sup> Saha et al. found that most children preferred saliva ejectors compared to cotton rolls and rubber dams.<sup>5</sup> Lygidakis et al. found that cotton rolls and rubber dam isolation provided similar results in tooth isolation.<sup>6</sup> Gilbert et al. found that the use of rubber dams varied significantly depending on certain dentists, restoration types, and patient-level characteristics.<sup>7</sup> Feierabend et al. found that the introduction of a new rubber dam design did not necessarily mean that it was more acceptable among patients, students, and dentists.<sup>8</sup> One limitation of the study was the limited sample size. Further research into these factors is warranted.

## CONCLUSION

With all the limitations considered and the evaluated responses from operators and children, it is clear that the new tool is superior in terms of isolating soft tissue and saliva, as well as aiding in mouth opening compared to cotton rolls and mouth mirrors. Additionally, this tool provided better accessibility for restorative and root canal

treatments. In terms of ease of use, the tool outperformed cotton rolls in terms of stability and the time required for placement.

## ORCID

Keyur M Chauhan  <https://orcid.org/0000-0001-5025-5771>

Harsh H Solanki  <https://orcid.org/0000-0002-2242-7991>

Reetu D Shah  <https://orcid.org/0000-0003-0064-3500>

Vaishnavi R Agarwal  <https://orcid.org/0000-0002-3670-7230>

## REFERENCES

1. Behuria PN. Isolation of teeth in children: a review. *Indian J Forensic Med Toxicol* 2020;14(4):9091–9094. DOI: 10.37506/ijfmt.v14i4.13160
2. Ammann P, Kolb A, Lussi A, et al. Influence of rubber dam on objective and subjective parameters of stress during dental treatment of children and adolescents—a randomized controlled clinical pilot study. *Int J Paediatr Dent* 2013;23(2):110–115. DOI: 10.1111/j.1365-263X.2012.01232.x
3. Mittal R, Sharma M. Assessment of psychological effects of dental treatment on children. *Contemp Clin Dent* 2012;3(Suppl 1):S2–S7. DOI: 10.4103/0976-237X.95093
4. Alsarheed M. Children's perception of their dentists. *European J Dent* 2011;5(2):186–190.
5. Saha A, Kamatham R, Mallineni SK, et al. A cross-sectional survey on children perception of isolation methods for restorative procedures and influence of cognitive development. *SRM J Res Dent Sci* 2016;7(4):219–221. DOI: 10.4103/0976-433X.195623
6. Lygidakis NA, Oulis KI, Christodoulidis A. Evaluation of fissure sealants retention following four different isolation and surface preparation techniques: four years clinical trial. *J Clin Pediatr Dent* 1994;19(1):23–25.
7. Gilbert GH, Litaker MS, Pihlstrom DJ, et al. Rubber dam use during routine operative dentistry procedures: findings from the dental PBRN. *Operat Dent* 2010;35(5):491–499. DOI: 10.2341/09-287C
8. Feierabend SA, Matt J, Klaiber B. A comparison of conventional and new rubber dam systems in dental practice. *Operat Dent* 2011;36(3):243–250. DOI: 10.2341/09-283-C