

# **Comparative Study Between Torsional And Conventional Linear Phacoemulsification In Management Of Hard Cataracts**

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# Abstract

## Purpose

To compare the efficacy, intraoperative performances and postoperative outcomes of cataract surgery performed with Torsional and Conventional Linear phacoemulsification in hard cataracts

## Methods

Of 50 patients who had senile hard cataracts, 50 eyes were operated on using the Infiniti vision system. Preoperative examinations (slit lamp examination, visual acuity, and IOP) were performed for each patient. Cataracts were classified into hard, according to the Lens Opacities Classification System III grading of nucleus opalescence. Eyes were randomly classified into 2 groups. Group A 25 eyes were randomly assigned to Torsional phaco-mode. Group B 25 eyes were randomly assigned to Conventional Linear phaco-mode. Intraoperative parameters, including Ultrasound Time (UST) and Cumulative Dissipated Energy (CDE), Percent of Equivalent US time in position 3 (USTEPiP3), and Mean BSS (Estimated Fluid used), (which were automatically calculated by the device), were evaluated. Intraoperative complications and difficulties were recorded. Postoperative corneal edema, Best Corrected Visual Acuity (BCVA) were checked after one week.

## Results:

The mean age of patients in the Torsional and Conventional Linear groups were  $60.5 \pm 7.8$  years and  $61.4 \pm 5.4$  years ( $p = 0.643$ ), respectively. Preoperative BCVA (log MAR) [ $0.78 \pm 0.09$  in group A and  $0.83 \pm 0.11$  in group B] and mean grading of nuclear hardness showed no difference in both groups. The differences in Ultrasound Time (UST) and Cumulative Dispersed Energy (CDE) in both groups were statistically significant ( $P < 0.01$ ). The mean UST and CDE were lower in the Torsional group ( $88.6 \pm 3.09$  sec &  $19.13 \pm 1.2$  respectively) than in the Conventional Linear US group ( $115.4 \pm 5.4$  sec &  $32.36 \pm 3.45$  respectively). The percent of Mean Total Equivalent time in position 3 (USTEPiP3), Mean Balanced Salt Solution (Estimated Fluid

Used) and Mean aspiration time were lower in group A than Group B. In group A there were 2 cases of posterior capsular rupture, while 3 cases were encountered in group B. Early postoperative mild corneal edema was more obvious in the Conventional Linear group than the Torsional group and last for 3 days only. The mean BCVA (log MAR) after one week was  $0.15 \pm 0.13$  in Group A and was  $0.23 \pm 0.05$  in Group B.

**Conclusions:**

The Torsional mode provides an effective and safe method for cataract removal as it uses less US energy and time as compared to Conventional Linear phacoemulsification, in the early postoperative stage. However, the final visual outcome was similar for both modalities. Both US modes are effective in management of grades III and IV cataracts.

**Key words**

Torsional Phacoemulsification- Conventional Linear  
Phacoemulsification- Hard Cataract