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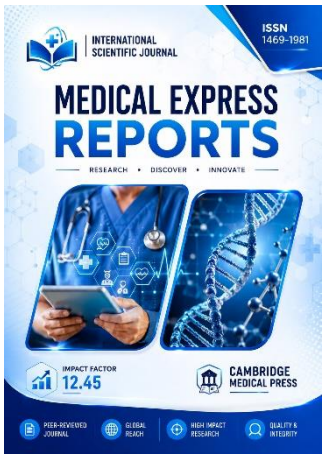

NEEDLE DECOMPRESSION CAPSULOTOMY AS A SAFER ALTERNATIVE TO STANDARD CAPSULORHEXIS IN SURGERY FOR HYPERMATURE AND INTUMESCENT CATARACTS: A COMPARATIVE STUDY IN SAMARKAND.

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ABSTRACT

This paper reports a comparative clinical observation of needle decompression assisted capsulotomy, referred to here as phacocapsulotomy, against standard continuous curvilinear capsulorhexis in the surgical management of hypermature and intumescent cataracts. The study was carried out at the Samarkand branch of the ophthalmic surgical service between 2023 and 2025 in 68 eyes with overripe or swollen lenses, thirty four of which were treated with each technique. Phacocapsulotomy involved creating a small controlled vent in the anterior capsule with a bent twenty six gauge needle, followed by gradual release of liquefied cortical material before completion of the capsular opening. In this series, phacocapsulotomy was associated with a higher rate of complete, tear free capsulotomy, fewer radial tears and posterior capsular ruptures, and no observed cases of the so called Argentinian flag sign, a sudden uncontrolled radial tear characteristic of white intumescent cataracts. In two eyes with weakened zonular support, an Alloplant biomaterial patch, a freeze dried allograft originally developed at the All Russian Center for Eye and Plastic Surgery in Ufa and used under licence at the Samarkand clinic, was applied to reinforce the capsule, with an uneventful outcome in both cases. Given the modest sample size and the absence of formal statistical testing, these findings should be regarded as a preliminary clinical observation consistent with

previously published needle decompression techniques rather than as definitive proof of superiority, and they support further, adequately powered comparative studies.

Background. Hypermature and intumescent cataracts present a recognised challenge in ophthalmic surgery because of the abnormally high intralenticular pressure that develops as liquefied cortical material accumulates beneath an intact anterior capsule. During conventional continuous curvilinear capsulorhexis, this elevated pressure can cause the initial capsular flap to propagate uncontrollably toward the periphery, producing the well described Argentinian flag sign, in which the tear extends radially and threatens the integrity of the entire capsular bag. Such an event increases the risk of posterior capsular rupture, vitreous loss, and compromised intraocular lens fixation, and is regarded as one of the more feared intraoperative complications of cataract surgery.

A number of methods for managing this risk have already been described in the international literature, including the two stage capsulorhexis technique originally proposed by Gimbel and Willerscheidt, the mini rhexis technique described by Kara Junior and colleagues, controlled needle aspiration of liquefied cortex as reported by Rao and Padmanabhan, and, more recently, automated capsular decompression using a needle connected to the phacoemulsification aspiration line. The technique examined in this paper, referred to locally as phacocapsulotomy, follows the same underlying principle of gradual pressure release through a small needle puncture prior to completion of the capsulorhexis, and is presented here as a local clinical experience rather than as an entirely new invention.

Purpose of the Study. The purpose of this study was to compare the intraoperative safety of needle decompression assisted capsulotomy with standard capsulorhexis in the surgical treatment of hypermature and intumescent cataracts, and to record the incidence of radial capsular tears, the Argentinian flag sign, and posterior capsular rupture in each group.

Materials and Methods. This was a retrospective comparative case series conducted at the ophthalmic surgical service in Samarkand, Uzbekistan, over the period from 2023 to 2025, including 68 eyes with hypermature or intumescent cataracts. Thirty four eyes were treated with needle decompression assisted capsulotomy, in which a bent twenty six gauge needle was used to create a small incision of approximately two to three millimetres in the anterior capsule, allowing controlled release of intralenticular pressure, followed by gradual aspiration of liquefied cortical material and completion of the capsular opening in the standard manner. The remaining thirty four eyes underwent conventional continuous curvilinear capsulorhexis. Allocation to technique was not randomised and reflected surgeon preference and case characteristics at the time of surgery, which is acknowledged as a limitation below. In two eyes

within the phacocapsulotomy group that demonstrated weakened zonular support, an Alloplant patch was additionally applied to reinforce the capsule; this biomaterial was originally developed at the All Russian Center for Eye and Plastic Surgery in Ufa, Russia, and is used at the Samarkand clinic under an established clinical collaboration. The outcomes recorded were the achievement of a complete capsulotomy free of radial tears, the occurrence of posterior capsular rupture, and the final centration of the intraocular lens at the conclusion of surgery. No formal sample size calculation or statistical hypothesis testing was performed, and the results below are therefore reported as descriptive proportions.

Results. A complete, tear free capsular opening was recorded in 97% of eyes in the phacocapsulotomy group, corresponding to 33 of 34 cases, compared with 79% in the standard capsulorhexis group, corresponding to 27 of 34 cases. Radial tears occurred in 3% of eyes treated with phacocapsulotomy, compared with 18% of eyes treated with standard capsulorhexis. No cases of posterior capsular rupture were recorded in the phacocapsulotomy group, whereas two ruptures, representing 6% of cases, occurred in the standard capsulorhexis group. Intraocular lens centration was satisfactory in all operated eyes across both groups.

Among eyes with white intumescent cataracts specifically, the standard capsulorhexis technique was associated with the Argentinian flag sign in 22% of cases, whereas no such tears were observed in the phacocapsulotomy group. The two eyes in which an Alloplant patch was used to reinforce weakened zonular support healed without complications during the observation period.

Given the sample size of 34 eyes per group, these differences, while clinically encouraging and consistent with the mechanism of pressure related capsular tearing described in intumescent cataracts, have not been confirmed by formal statistical testing in this series and should be interpreted with corresponding caution.

Discussion. The pattern of results observed in this series is consistent with the established mechanism of intumescent cataract, in which elevated intralenticular pressure predisposes the capsule to sudden uncontrolled rupture once a standard circular opening is initiated, and with previously published reports in which a preliminary needle puncture and gradual decompression reduced the frequency of radial tears and the Argentinian flag sign. The absence of this complication in the phacocapsulotomy group in the present series is in line with, rather than superior in kind to, findings already reported using related needle based and two stage capsulorhexis techniques.

The successful use of an Alloplant patch in the two eyes with compromised zonular support is consistent with prior experience at the Ufa center where this biomaterial was developed, and its use in Samarkand under clinical collaboration illustrates the transfer of this material into regional practice rather than an independent local invention of the biomaterial itself.

Several limitations should be acknowledged. Allocation between groups was not randomised, which introduces a risk of selection bias, for example if surgeons preferentially chose one

technique for less advanced cases. The sample size of 34 eyes per group is modest, and no formal statistical comparison was performed, so the reported differences in proportions should be regarded as descriptive rather than confirmatory. The study did not report postoperative visual acuity, refractive outcomes, or length of follow up, and did not control for cataract density or surgeon experience between groups. These limitations mean the findings are best understood as a supportive local clinical observation, in keeping with the wider published literature on needle decompression techniques, rather than as definitive proof that the technique is superior to standard capsulorhexis.

Conclusion. In this retrospective series from Samarkand, needle decompression assisted capsulotomy was associated with fewer radial capsular tears, no observed posterior capsular rupture, and no cases of the Argentinian flag sign compared with standard capsulorhexis in eyes with hypermature and intumescent cataracts. These observations are consistent with previously described needle based decompression techniques and support the continued use of this simple, low cost approach in regional practice, while indicating a need for prospective, randomised, and adequately powered studies before firmer conclusions on comparative safety can be drawn.

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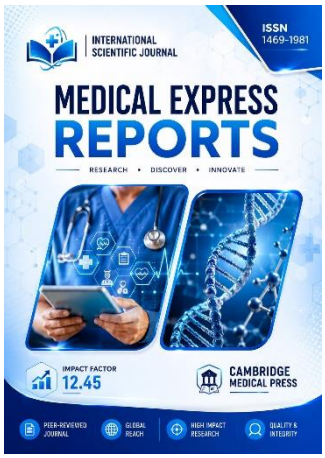

EXPERIENCE IN THE SURGICAL MANAGEMENT OF PROXIMAL HYPOSPADIAS IN CHILDREN AT THE REPUBLICAN SPECIALIZED SCIENTIFIC AND PRACTICAL MEDICAL CENTER OF UROLOGY

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ABSTRACT

Проксимальные формы гипоспадии относятся к наиболее сложным врожденным порокам развития наружных половых органов у детей и характеризуются высокой частотой послеоперационных осложнений. В исследовании проведен анализ результатов хирургического лечения 66 детей с различными вариантами проксимальной гипоспадии, проходивших лечение в Республиканском специализированном научно-практическом медицинском центре урологии. Оценены особенности предоперационной подготовки, выбор