

Intravenous Ketamine with Local Anaesthesia as an Alternative to General Anaesthesia for Orchidopexy in ChildrenSyed Moinuddin Omar¹, Syed Ameenuddin Ali²¹Assistant Professor, Department of Anaesthesia, JIIU'S Indian Institute of Medical Science and Research, Warudi, Dist.-Jalna, Maharashtra, India.²Assistant Professor, Department of Surgery, JIIU'S Indian Institute of Medical Science and Research, Warudi, Dist.-Jalna, Maharashtra, India.

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Conflict of interest: Nil

Abstract:**Introduction:** Undescended Testis is the most common birth defect of male genitalia. Two factors are very important in determining the type of anaesthesia in children, one is clinical presentation: palpable or impalpable and the second is unilateral or bilateral presentation.**Material method:** This is a review of 243 Cases of Undescended Testis operated in our Institute over a period of 10 years. For cases of palpable testis with unilateral and occasionally bilateral presentation we used anaesthetic technique of Ketamine plus local infiltration.**Results:** Most Pediatric Surgeons prefer General Anaesthesia for children for doing Orchidopexy, but in selected cases like Unilateral, Palpable Undescended Testis Sedation by Intravenous Ketamine along with Local Anaesthesia can be safely used for Orchidopexy in children. With the use of Ketamine patients can be kept on spontaneous ventilation with oxygen by facemask, thereby avoiding the need for intubation and muscle relaxants that is required with use of General Anaesthesia.**Keywords:** Orchidopexy, Undescended Testis, Ketamine, Local AnaesthesiaThis is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Undescended Testis is the most common birth defect of male genitalia [1,2]. Usually it is unilateral but in 10% of cases it is bilateral. Various classifications have been used for Undescended testis but clinically there are mainly two types, Palpable and Impalpable. Orchidopexy is successful in 95% of standard Orchidopexy with complication rate of 1% [3]. Majority of Surgeons recommend operation at 6 months [4], but in rural areas presentation is often late. Two factors are very important in determining the type of anaesthesia in children, one is clinical presentation: palpable or impalpable and the second is unilateral or bilateral presentation.

Material and Methods

This is Retrospective study of 243 cases of undescended cases operated between January 2013 to December 2022 over a period of 10 years. Records were checked for age of presentation and operation, reason for presentation, clinical types,

Ultrasonography report, operative findings, procedure and type of anaesthesia used. For cases of palpable testis with unilateral and occasionally bilateral presentation we used anaesthetic technique of Ketamine plus local infiltration. Patients were premeditated with injection Glycopyrrolate 0.004 mg/kg and Injection Midazolam 0.05 mg/kg. Intravenous Ketamine was given in the dose of 2 mg/kg and Local infiltration was done with 1% Lignocaine at the site of surgical incision. Patient was kept on spontaneous respiration with oxygen by facemask. Out of 119 patients given ketamine only 3 required conversion to general anaesthesia with intubation and muscle relaxation.

Results:

The age of presentation was between 3 months and 70 years [Table-1], with mean age of 13 years.

Table 1: Age of presentation

AGE	NO. OF CASES
3 months to 1 year	26
1 to 5 years	67
6 to 10 years	51
11 to 15 years	36
16 to 20 years	19
21 to 30 years	27
31 to 70 years	17

121 cases had right sided undescended testis, 98 had left sided and 24 had bilateral making a total of 267 undescended testes.[Table-2].

Table 2: Side of undescended testis

SIDE	NO. OF PATIENTS
Right	121
Left	98
Bilateral	24

188 were Palpable and 79 were Impalpable. The various sites of testes are shown in Table-3.

Table 3: Site of undescended testis

Site	No. of Cases
Inguinal	161
Intraabdominal	33
Ectopic	28
Retractile	5
Canalicular	14
Absent or Atrophic	26
Total	267

Orchidopexy was done in 197, orchidectomy in 27, first stage Orchidopexy in 29 and exploration in 14.

Table 4: Procedure performed

Procedure	No.
Orchidopexy	197
Orchidectomy	27
First stage Orchidopexy	29
Exploration	14
Total	267

119 patients were given Intravenous Ketamine and Local Anaesthesia, 77 had Spinal Anaesthesia and 47 had General Anaesthesia.

Table 5: Anaesthesia given

Anaesthesia	No. of Patients
Ketamine and Local Anaesthesia	119
Spinal Anaesthesia	77
General Anaesthesia	47
Total	243

Discussion

Undescended testes (Cryptorchidism) refers to the condition where the testicle fails to descent to its normal position in the scrotum. Undescended Testes are usually diagnosed soon after birth, but in rural areas, presentation is often late. There are several reasons for that like lack of awareness, illiteracy, lack of facilities and poverty. Clinical examination and investigation like ultrasonography is important to assess the position and size of the testis. In few cases Magnetic resonance imaging may be needed if testis is impalpable and not seen on ultrasonography. After the age of 4-6 months

undescended testes is less likely to descend spontaneously [5]. Such cases require surgical intervention with fixation of the testis within the scrotum (orchiopexy). Successful scrotal repositioning of the testis may reduce the potential long-term issues of infertility and testicular cancer. Some cases require removal of the undescended testis (orchidectomy), this includes patients with dysmorphic or hypoplastic testis, post-pubertal age and normal contralateral testis [6].

Selection of anaesthesia can be done according to age of patient, type of undescended testis, procedure to be performed and preference of Surgeon and

Anaesthesiologist. Ketamine is a phencyclidine derivative and a non-competitive antagonist at NMDA receptors [7]. It produces Dissociative anaesthesia as a result of functional dissociation between cortical and limbic system [8]. Ketamine is a potent analgesic with rapid onset of action and produced sedation without the depression of spontaneous respiration [9]. Ketamine can also be used for perioperative pain management [10].

Orchidopexy involves surgical exploration of the inguinal region with dissection and traction on the spermatic cord. A scrotal incision is also taken to fix the testis in its normal position. Anaesthesia technique generally involve I.V. or inhalational induction with spontaneous respiration. Analgesia can be provided by ilioinguinal block and local infiltration of scrotal wound. Caudal anaesthesia may be used in bilateral cases [11]. For older children and adults spinal anaesthesia can be used [12]. Amongst the general public less than 1% have awareness about undescended testis and none of them know about the age of operation [13]. The risk of malignancy is higher in undescended testis and highest in Intraabdominal testis [14]. Management can be improved by educating the primary health care practitioners [15]. Intravenous Ketamine with Local anaesthesia is a safe technique with rapid recovery and minimal side effects and can serve as alternative to Deep sedation [16].

Conclusion

Late presentation is one of the main reasons for high incidence of Atrophy of testis especially impalpable testis. Education is important for bringing awareness amongst the public about such anomalies so that early presentation and early treatment can be done. General anaesthesia requires muscle relaxant, intubation and ventilator support. Intravenous ketamine with local anaesthesia in selected cases is safer and can be done in unilateral undescended testis and palpable testis in children. In bilateral palpable testes also this anaesthesia technique may be used. For adults, spinal anaesthesia is preferable.

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