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ORIGINAL ARTICLE

Traditional Inguinal Incision and High Scrotal Incision (Bianchi) in Management of Encysted hydrocele in children- a Comparative Study

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ABSTRACT

Keywords: : Inguinal incision, high scrotal incision, encysted, hydrocele

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Background: A hydrocele is a collection of peritoneal fluid between the parietal andvisceral layers of the tunica vaginalis.**Aim:** to compare between the traditional inguinalincisionandsinglehighscrotalincisioninmanagementofencystedhydrocele ofthe cordinchildren. **Patients and Methods:i**nt his prospective randomized study, forty boy patients aged from 2 to 18 years were operated in Pediatric Surgery Unit at Aswan University Hospital. This study was performed from April 2022 till March 2023. **Results:** Our study findings revealed that; mean hospital stay, operative time, pediatrics more than 4 years-old assessed by Face, leg, activity, cry consolabilty assessed by Faces pain score, pediatrics less than 4 years-old assessed by (FLACC) pain score, postoperative was statistically significant differences. **Conclusion:** Single high scrotal incision technique has better outcomethantraditionalincisiontechniquesinthemanagementofencystedhydroceleofthecordinchildren.

INTRODUCTION

The scrotum is a thin external sac that is located under the penis and iscomposed of skin and smooth muscle.[1] This sac is divided intotwo compartments by the scrotal septum with an average wall thickness of about 8mm. It has parietal and visceral layers. The parietal layer has the function ofcoveringthe inneraspect ofthe scrotal wallandthevisceral layercoatsthetestis and epididymis. The structures contained in the scrotal sac are the external spermaticfascia,testes,epididymis,andspermaticcord.[2]

The processus vaginalis appears at about 13 weeks of fetal developmentas an outpouching of the parietal peritoneum, through which the testis descendsfrom the abdomen to the scrotum between the 7th and 9th months of fetal life.[3] Hydrocelesarisefromanimbalanceofsecretionandreabsorption of fluid from the tunica vaginalis. In an attempt to understand thepathophysiologyofpediatrichydroceles,itisnecessarytofirstclarifythenormal embryologyoftesticulardescent.[4]

In encysted hydrocele of the cord, there is fluid in the spermatic cord butno opening into the abdomen or scrotum. Fluid cannot pass through the tunnelfrom the abdomen or travel further down

into the tunica vaginalis sac in thescrotum. Instead, the fluid sits in the spermatic cord.[5]
Thetraditionalprocedureisthe inguinal approach through inguinal incision.[5] Bianchi andSquire reported a high scrotal incision to ligate the processus vaginalis proximaltotheexternalring,inordertoperformorchiopexiesin1989,whichwassubsequently named as Bianchi incision. This technique has been used for otheringuinoscrotalproblemsashernia andhydrocele. The benefits of this procedure are short operative time, less postoperative pain,and better cosmetic results.[6]
The aim of the study is to compare between the traditional inguinalincisionandhighscrotalincisioninmanagementofencystedhydrocele ofthe cordinchildren.

PATIENTS AND METHODS

Inthisprospectiverandomizedstudy,fortyboypatientsofagesfrom2yearsto18yearswerescheduledforencystedhydroceleofthecordconfirmedbyclinicalexaminationandultrasonographicinvestigations.Theywererandomizedintotwogroups:Group(A)-included20 patientsmanagedwithBianchiincision scrotal approach, while; Group (B) - included 20 patients managed withtraditionalinguinalapproach.

Patient Criteria

InclusionCriteria

Forty boys patients of ages from 2 years to 18 years were scheduled forencysted hydrocele of the cordconfirmedby clinical examinationand ultrasonographic investigations.

ExclusionCriteria

- Associatedotheringuinoscrotalswellings.
- Previousoperationininguinoscrotalregion
- Presenceofinfection

Methods

PreoperativeAssessment

Completehistorytaking,age,sex,residency,timeofonsetandcomplications. Clinicalexamination: To confirm the diagnosis of encysted hydrocele in children inguinoscrotal ultrasound assessments were performed for all included childrencommenting on theswelling andtesticularvascularityandsize. LaboratoryInvestigations included Completebloodcount(CBC)andCoagulationProfile.

Surgical Procedures

ScrotalIncision(Binchai Incision)Hydrocelectomy

Afterwards general anesthesia induction, a crosswise skin cut was madelaterally high in scrotal skin folds. The scrotal wound was withdrawn rising toease dissection, and the cordcover and adhesion tissues were divided at themostcephaladlocationfeasibletoguaranteeadequatecordextentandtoprobably permit entering into the lower half of the inguinal duct from below.The gubernacular links were freed to allow identifications of the testes (in thecremastericfiber),the patent processus vaginalis (PPV),andthecordconstructions. The testis wassubsequently re-located into the dartos pouch, and 2 (medially and laterally)obsession sutures have been located amid the testicular tunic albuginea andinternal scrotalbarriertoavoid testicular ascents. Hypodermic tissues were sewed via Vicryl 3/0, and the skin was sewedsubcuticularwith4/0polypropylene,withnodraininsertions.

TraditionalInguinalIncisionHydrocelectomy

The 1stStage of inguinal incisions hydrocelectomy was formation of askin-crease inguinalcut over the exterior inguinal circle. Dissection continueddownwardtotheoutsidecircleandtheexterioroblique aponeurosis.Theilioinguinalnerveslocated underneath the aponeurosis was conserved to lessen the risk of post-operative and pain. Afterward

reinsertion of thetestis through the cut location, the hydrocele sac was unlocked, and irrigationswere done to prevent wounds contamination by hydrocele fluids. PPV high-ligationhasbeenachievedandthetestiswasre-positionedinthehemiscrotum.
Theinguinalcutwaslocked;theexterioroblique aponeurosisandhypodermic tissues layers have been sewed with Vicryl 3/0, and the skin waslocked with sub-cuticular 4/0 polypropylene seams and no drainage pipe waslocated.

PostoperativeAssessment

The patientwillbe discharged6 hoursfully recoveredfromanesthesia. Painwillbeassessedusingthefollowingscales: Facespainscale-revisedinchildren4-8yearsold. FLACCinchildren<4yearsold. Followup:(Conducted attheoutpatientclinics): firstvisit was5dayspostoperativeandfrequentvisits asneeded. EarlyAssessment,after10daysfromthe operation: Wound infection and Postoperativeedema. Late assessment, after 3 months from theoperation: Ultrasoundassessment oftesticularsizeand vascularity, Recurrence and Cosmeticresults.

Follow up: (Conducted at the outpatient clinics) 1st visit were 5 days postoperative and frequent visits as needed. Early Assessment, after 2 weeks from the operation: Wound infection and Postoperative edema. Late assessment, after 3 months from the operation: Ultrasound assessment of testicular size and vascularity, Recurrence and Cosmetic results

StatisticalAnalysis

DataobtainedwascollectedandanalyzedstatisticallyusingStatisticalPackagefor Social Science (IBMSPSSStatistics23.0). Ttestswereperformedto determinetest ofsignificance. Pvalue<0.05werestatisticallysignificant,Pvalue <0.0001*werehighly statistically significantandPvalue>/= 0.05 werenonstatisticallysignificant.

EthicalConsiderations: The signed informed consent form was taken from participants' parents; was a part of the study records.

RESULTS

The mean age of the included patients were 3.6 ± 2.0 years-old for group (A) and were4.6 ± 2.8 years-old for group (B). The mean hospital stay were 3.94 ± 0.30 hours forgroup(A)while were 4.24±0.99 for group(B), pvalue< 0.009whichwasstatisticallysignificancedifferences. The mean operative time of the included patients forgroup (A) and for group (B), p value < 0.0001 which was statistically highly significancedifferences.

Pain score assessment was applied through pediatrics more than 4 years old byFaces pain score for Group (A) and forGroup (B) with significant value < 0.009, there was statistically significancedifferences. While Pain scorewas applied through pediatrics less than 4 years-oldbyFLACCpainscoreforGroup(A)and for Group (B) with significant value < 0.001, there was statisticallyhighlysignificance differences.

Themeanpostoperativeassessmentafter5daysfromtheoperationwasfor Group (A) and for Group (B) with significant value <0.009,therewasstatisticallyhighlysignificancedifferences.

DISCUSSION

The operative method comprises release of thespermatic cord from the connected tissues, tissues separation, and high ligationof the PPV. It is significant to avoid vase and vesselsinjury at highly ligation of the PPV. Then, the testicle was immobile to thescrotumwithnotensions.[7]

Therefore, the aim of the study is to compare between the traditionalinguinal incision and high

scrotal incision in management of encystedhydroceleof the cordinchildren.

Inourstudy,the meanhospitalstay was statistically significant between group (A) and group (B), p value < 0.009. In agreement with our findings, **Nazem*etal.*,**[8] and **Mouravas*et al.*,**[9]showed that thehospitalstaywas 3.94 ±0.30-days ingroupIand4.24 ±0.99-days ingroup-II.

The mean difference in operative time between group(A) and group (B), was statistically highlysignificance p value < 0.0001.

Inastudyby**Dogra*etal.*,**[10]**found**a meanoperatingtimeof22.40 ± 4.139 minutes using high scrotal incision herniotomy which was lower thanthe37.1 ±13.3 minutesdocumentedinourstudy.

Similar findings have been concluded by **Burcharth*et al.*,[11]illustrated** that the surgical duration was 30.94 ± 3.95-min in group-I and 38.02 ±7.12-min in group-II. The operation time was shorter significantly in group-I ascompared withgroup II (p-value<0.001).

Pain in pediatricsmore than4years oldforGroup (A) was significant differ from Group (B) p-value < 0.009.Painfor pediatricslessthan4years oldGroup(A) was significant differ from Group(B) p-value <0.001.

In another study, the pain assessment using FLACC and Faces ofhigh scrotal was lower than that of the conventional approach**FrushandSheldon,[12] and** this is in tandem with a comparative study by **Khan *et al.*,[13]**

The postoperative wound assessment after 5 days from theoperation for Group(A) and Group(B) was significant p-value<0.009,therewasstatisticallyhighlysignificancedifferences. Theearlyassessmentafter10daysfromtheoperation;represents0(0%)forwoundinfectioninGroup(A)and 3(15%)forGroup(B)withsignificantvalue<0.0001,andedemarepresents4(20%)forGroup(A)and3(15%)forGroup (B)withsignificantvalue>0.0421.

Thelate assessmentafter 3monthsfrom the operation;represents 20(100 %) for cosmetic in Group (A) and 18 (90 %) for Group (B), and recurrencerepresents0(0%) forGroup (A) and2(10%)for Group(B). The ultrasound assessment after the operation represents 20 (100 %) fornormal in Group (A) and for Group (B), and vascularity represents 1 (5 %) forGroup (A) and3(15%) for Group(B).

Previous studies documented that the pain assessment using high scrotaltechniquewaslowerthanthatofconventionaltechnique**Iida *etal.*,[14]**However, **Adlan and Freeman,[15]**a significant number of patientsin the high scrotal group had scrotal edema in the early post-operative periodcompared tothe conventionalapproach. However, **Rubin *et al.*,[16]**the traditional approach operation timewas longer than that of scrotal hydrocelectomy, and the incision scars probablyweremore noticeablethanthescrotalincision scars. Furthermore,previousreports**Langer,[17] have**shownthatthescrotal approach was better than traditional for correction of cryptorchidism inboys isalsosimple andeffective. In addition to postoperatively ultrasound **Adlan and Freeman,[15]**;showed adequate vascular changes in traditional group other than high scrotalgroup.

CONCLUSION

High scrotal incision technique has better outcome in comparison to the traditionalincisiontechniqueinthemanagementofencystedhydroceleofthecordinchildren.

Thescrotalincisionapproachmightbeanalternativetreatmentforhydrocele in boys when traditional inguinal approach is unfeasible, associatedwith a low postoperative complication rate, short operation time, and shorthospital stay.

REFERENCES

1. AndrewsEW.The“BottleOperation”methodfortheradicalcureofhydrocele.AnnSurg 2019;46:915–8.
2. ChangY-T,LeeJ-Y,WangJ-Y,etal.Hydroceleofthespermaticcordininfantsand children:Itsparticularcharacteristics.Urology2020;76:82–6.
3. Glick PL, Boulanger SC. Inguinal hernias, and hydroceles. Pediatric surgery. 6thedition. Vol. 2. Philadelphia: Mosby 2016: 1172–92, 430-485.
4. Morecroft JA, Stringer MD, Homes SJK, et al. Follow-up after inguinalherniotomyorsurgeryforhydroceleinboys.Br JSurg2019;80:1613–4.
5. Davies BW, Fraser N, Najmaldin AS, et al. A prospective study of neonatalinguinal herniotomy: the problem of the postoperative hydrocele. PediatrSurgInt2017;19:68–70.
6. Alp, B. et al. ‘Comparison of the inguinal and scrotal approaches for thetreatment of communicating hydrocLin, J. ‘Inguinal hernia repair by Bianchi incision in boys: a retrospectivestudy,’ Pediatric Surgery International. Springer Verlag, 2018; 34(3), pp.289–295.
7. Lin, J. ‘Inguinal hernia repair by Bianchi incision in boys: a retrospectivestudy,’ Pediatric Surgery International. Springer Verlag, 2018; 34(3), pp.289–295.
8. Nazem M, Hosseinpour M, Alghazali A. Trans-scrotal Incision ApproachversusTraditionalTrans-scrotalIncisionOrchiopexyinChildrenwithCryptorchidism:ARandomizedTrialStudy. AdvBiomedRes.2019; 8:34
9. Mouravas VK, Koletsa T, Sfougaris DK, Philippopoulos A, Petropoulos AS,Zavitsanakis A, et al. Smooth muscle cell differentiation in the processusvaginalisofchildrenwithherniaorhydrocele.Hernia.2020;14(2):187-91
10. DograVS,GottliebRH,OkaM,RubensDJ.Sonographyofthescrotum. Radiology2021;227: 18–36
11. BurcharthJ,PommergaardHC,RosenbergJ.Theinheritanceofgroinhernia: asystematicreview.Hernia.2017;17(2):183-9
12. FrushDP,SheldonCA.Diagnosticimagingforpediatricscrotaldisorders. RadioGraphics2018;18:969–985
13. Khan RA, Wahab S, Chana RS, Fareed R. Isolated retroperitoneal hydatidcystinachild:ararecauseofacutescrotalswelling?JPediatrSurg.2020;45(8):1717-9
14. Iida K, Mizuno K, Nishio H, Moritoki Y, Kamisawa H, Kurokawa S, KohriK,HayashiY.AccessoryScrotumwithPerinealLipoma:Pathologic Evaluation Including Androgen Receptor Expression. UrolCaseRep.2018;2(6):191-3
15. Adlan T, Freeman SJ. Can ultrasound help to manage patients with scrotaltrauma?Ultrasound. 2021;22(4):205-12
16. Rubin JM, Bude RO, Carson PL, Bree RL, Adler RS. Power Doppler US: apotentially useful alternative to mean frequency–based color Doppler

US.Radiology2019; 190:853–856
17. Langer M. About the Hernia and Hydrocele of Childhood. Arch of KlinChir.2019; 18:418

Table(1)-DemographicDataoftheIncludedPatients

Demographic Data(Age) Years - Old	**Group(A)**	**Group(B)**	**Pvalue**
Mean ±SD	3.6 ± 2.0	4.6 ± 2.8	>0.190
Min.-Max.	2 -7	2 -8	
Median	5	4	

Table(2)-SurgicalOutcomesoftheIncludedPatients

SurgicalOutcomes	**Group(A)**	**Group(B)**	**Pvalue**
HospitalStay			
Mean ±SD	3.94±0.30	4.24±0.99	<0.009
Min-Max	1 -3	3 -6	
OperativeTime(minutes)			
Mean ±SD	30.94±3.95	38.02±7.12	<0.0001
Min-Max	8-35	20-50	

Table(3)-PainAssessmentoftheIncludedPatients

SurgicalOutcomes	**Group(A)**	**Group(B)**	**Pvalue**
FACESPainScoreAssessment			
Mean ±SD	3.94±0.95	8.02±2.12	<0.009
FLACCPainScoreAssessment			
Mean ±SD	12.6±2.02	16.4±4.82	<0.0001

Table(4)-Follow-UpAssessmentoftheIncludedPatients

SurgicalOutcomes	Group(A)	Group(B)	Pvalue
Postoperative(5daysafteroperation)			
Mean ±SD	3.94±0.30	4.24±0.99	<0.009
EarlyAssessment(2 weeksafteroperation)			
WoundInfection	0(0 %)	3 (15%)	
Edema	4 (20%)	3(15 %)	
LateAssessment(3months afteroperation)			
Cosmetic	20(100 %)	18(90 %)	
Recurrence	0(0%)	2 (10%)	
UltrasoundAssessment			
TesticularSize	Normal 20(100 %)	Normal 20 (0 %)	
Vascularity	1(5 %)	3 (15%)	