

REFERENCES

REFERENCES

1. Thomas JC, McMarco RT, Donoboe JM. Pediatric ureteroscopic stone management. *J Urol* 2005; 174: 1072-4.
2. Holman E, Flasko T, Toth C. Endoscopic management of pediatric urolithiasis in a developing country. *Urol* 2004; 63: 159-62.
3. Sarkissian A, Babloyan A, Arikyants N. Pediatric urolithiasis in Armenia: a study of 198 patients observed from 1991 to 1999. *Pediatr Nephrol* 2001; 16: 728-32.
4. Humphreys J, Coward RJ. Renal stones in paediatric practice. *Paediatrics and Child Health* 2010; 20: 279-85.
5. Ramello A, Vitale C, Marangella M. Epidemiology of nephrolithiasis. *J Nephrol* 2000; 13: 545-50.
6. Sternberg K, Greenfield SP, Williot P, Wan J. Pediatric stone disease: an evolving experience. *J Urol* 2005; 174(4 Pt 2): 1711-4.
7. Watts RW. Factors governing urinary tract stone disease. *Pediatr Nephrol* 1989; 3: 332-40.
8. Gault MH, Chafe L. Relationship of frequency, age and sex, stone weight and composition in 15,624 stones: comparison of results for 1980 to 1983 and 1995 to 1998. *J Urol* 2000; 164: 302.
9. Robertson WG, Peacock M, Heyburn PJ. Clinical and metabolic aspects of urinary stone disease in leads. *Scand J Urol* 1980; 53(Suppl): 199.
10. Polinsky MS, Kaiser BA, Baluarte HJ. Urolithiasis in childhood. *Pediatr Cl in North Am* 1987; 34: 683-710.
11. Diamond DA, Rickwood AM, Lee PH, Johnston JH. Infection stones in children: a twenty-seven-year review. *Urology* 1994; 43: 525-7.
12. Laufer J, Boichis H. Urolithiasis in children: current medical management. *Pediatr Nephro* 1989; 13: 317-31.
13. Noe HN, Stapleton FB, Jerkins GR, Roy S 3rd. Clinical experience with pediatric urolithiasis. *J Urol* 1983; 129: 1166-8.
14. Hesse A, Bröndle E, Wilbert D, Köhrmann KU, Alken P. Study on the prevalence and incidence of urolithiasis in Germany comparing the years 1979 vs. 2006. *Eur Urol* 2003; 44: 709-13.
15. Aldridge RD, Aldridge RC, Aldridge LM. Anesthesia for pediatric lithotripsy. *Paediatr Anaesth* 2006; 16: 236-41.
16. Todd DC, Jeff E, Lowell RK. Pediatric urolithiasis: medical and surgical management. *Urol* 1996; 47: 292-303.
17. Grogory T. Renal structure in: *Hinman's Atlas of Urosurgical Anatomy* 2nd ed. Philadelphia. Elsevier 2012; 3: 187-9.

18. McLorie GA, Pugach J, Pode D, Denstedt J, Bagli D, Meretyk S, et al. Safety and efficacy of extracorporeal shock wave lithotripsy in infants. *Can J Urol* 2003; 10: 2051-5.
19. Kruse K, Kracht U, Kruse U. Reference values for urinary calcium excretion and screening for hypercalciuria in children and adolescents. *Eur J Pediatr* 1984; 143: 23-31.
20. Minevich E. Pediatric urolithiasis. *Pediatr CI in North Am* 2001; 48: 1571-85.
21. Sargent JD, Stukel TA, Kresel J, Klein RZ. Normal values for random urinary calcium to creatinine ratios in infancy. *J Pediatr* 1993; 123: 393-7.
22. Al Busaidy SS, Prem AR, Medhat M. Paediatric ureteroscopy for ureteric calculi: a 4-year experience. *Br J Urol* 1997; 80: 797-801.
23. Stapleton FB, Noe HN, Roy S 3rd, Jerkins G. Hypercalciuria in children with urolithiasis. *Am J Dis Child* 1982; 136: 675-8.
24. Stapleton FB, Noe HN, Jerkins G, Roy S 3rd. Urinary excretion of calcium following an oral calcium loading test in healthy children. *Pediatrics* 1982; 69: 594-7.
25. Borghi L, Schianchi T, Meschi T, Guerra A, Allegri F, Maggiore U, et al. Comparison of two diets for the prevention of recurrent stones in idiopathic hypercalciuria. *N Engl J Med* 2002; 346: 77-84.
26. Bartosh SM. Medical management of pediatric stone disease. *Urol CI in North Am* 2004; 31: 575-87.
27. Preminger GM, Pak CY. Eventual attenuation of hypocalciuric response to hydrochlorothiazide in absorptive hypercalciuria. *J Urol* 1987; 137: 1104-9.
28. Tekin A, Tekgul S, Atsu N, Bakkaloglu M, Kendi S. Oral potassium citrate treatment for idiopathic hypocitruria in children with calcium urolithiasis. *J Urol* 2002; 168: 2572-4.
29. Morgenstern BZ, Milliner DS, Murphy ME, Simmons PS, Moyer TP, Wilson DM, et al. Urinary oxalate and glycolate excretion patterns in the first year of life: a longitudinal study. *J Pediatr* 1993; 123: 248-51.
30. Hillman RE. Primary Hyperoxalurias. New York: McGraw-Hill, 1989.
31. Defoor W, Asplin J, Jackson E, Jackson C, Reddy P, Sheldon C, et al. Results of a prospective trial to compare normal urine supersaturation in children and adults. *J Urol* 2005; 174(4 Pt 2): 1708-10.
32. Tekin A, Tekgul S, Atsu N, Sahin A, Ozen H, Bakkaloglu M. A study of the etiology of idiopathic calcium urolithiasis in children: hypocitruria is the most important risk factor. *J Urol* 2000; 164: 162-5.
33. Brenner RJ, Spring DB, Sebastian A, McSherry EM, Genant HK, Palubinskas AJ, et al. Incidence of radiographically evident bone disease, nephrocalcinosis, and nephrolithiasis in various types of renal tubular acidosis. *N Engl J Med* 1982; 307: 217-21.
34. Konnak JW, Kogan BA, Lau K. Renal calculi associated with incomplete distal renal tubular acidosis. *J Urol* 1982; 128: 900-2.

35. Preminger GM, Sakhaee K, Skurla C, Pak CY. Prevention of recurrent calcium stone formation with potassium citrate therapy in patients with distal renal tubular acidosis. *J Urol* 1985; 134: 20-3.
36. Preminger GM, Sakhaee K, Pak CY. Alkali action on the urinary crystallization of calcium salts: contrasting responses to sodium citrate and potassium citrate. *J Urol* 1988; 139: 240-2.
37. Tekin A, Tekgul S, Atsu N, Sahin A, Bakkaloglu M. Cystine calculi in children: the results of a metabolic evaluation and response to medical therapy. *J Urol* 2001; 165(6 Pt 2): 2328-30.
38. Kambadakone AR, Eisner BH, Catalano OA, Sahani DV. New and evolving concepts in the imaging and management of urolithiasis. Urologists' perspective. *Radiographics* 2010; 30: 603-23.
39. Oner S, Oto A, Tekgul S, Koroglu M, Hascicek M, Sahin A, et al. Comparison of spiral CT and US in the evaluation of pediatric urolithiasis. *JBR-BTR* 2004; 87: 219-23.
40. Memarsadeghi M, Heinz-Peer G, Helbich TH, Schaefer-Prokop C, Kramer G, Scharitzer M, et al. Unenhanced multi-detector row CT in patients suspected of having urinary stone disease: effect of section width on diagnosis. *Radiology* 2005; 235: 530-6.
41. Strouse PJ, Bates DG, Bloom DA, Goodsitt MM. Non-contrast thin-section helical CT of urinary tract calculi in children. *Pediatr Radiol* 2002; 32: 326-32.
42. Straub M, Strohmaier WL, Berg W, Beck B, Hoppe B, Laube N, et al. Diagnosis and metaphylaxis of stone disease. Consensus concept of the National Working Committee on Stone Disease for the upcoming German Urolithiasis Guideline. *World J Urol* 2005; 23: 309-23.
43. Tiselius HG, Ackermann D, Alken P, Buck C, Conort P, Gallucci M, et al. Guidelines on urolithiasis. *Eur Urol* 2001; 40: 362-71.
44. Cohen TD, Ehreth J, King LR, Preminger GM. Pediatric urolithiasis: medical and surgical management. *Urology* 1996; 47: 292-303.
45. Tekin A, Tekgul S, Atsu N, Sahin A, Ozen H, Bakkaloglu M. A study of the etiology of idiopathic calcium urolithiasis in children: hypocitruria is the most important risk factor. *J Urol* 2000; 164: 162-5.
46. Pietrow PK, Pope JC, Adams MC, Shyr Y, Brock JW 3rd. Clinical outcome of pediatric stone disease. *J Urol* 2002; 167(2 Pt 1): 670-3.
47. Raza A, Turna B, Smith G, Moussa S, Tolley DA. Pediatric urolithiasis: 15 years of local experience with minimally invasive endourological management of pediatric calculi. *J Urol* 2005; 174: 682-5.
48. Rizvi SA, Naqvi SA, Hussain Z, Hashmi A, Hussain M, Zafar MN, et al. Pediatric urolithiasis: developing nation perspectives. *J Urol* 2002; 168(4 Pt 1): 1522-5.
49. Newman DM, Coury T, Lingeman JE, Mertz JH, Mosbaugh PG, Steele RE, et al. Extracorporeal shock wave lithotripsy experience in children. *J Urol* 1986; 136(1 Pt 2): 238-40.

50. Willis LR, Evan AP, Connors BA, Blomgren P, Fineberg NS, Lingeman JE. Relationship between kidney size, renal injury, and renal impairment induced by shock wave lithotripsy. *J Am Soc Nephrol* 1999; 10: 1753-62.
51. Villanyi KK, Szekely JG, Farkas LM, Javor E, Pusztai C. Short-term changes in renal function after extracorporeal shock wave lithotripsy in children. *J Urol* 2001; 166: 222-4.
52. Aksoy Y, Ozbey I, Atmaca AF, Polat O. Extracorporeal shock wave lithotripsy in children: experience using a mpl-9000 lithotripter. *World J Urol* 2004; 22: 115-9.
53. Vljakovic M, Slavkovic A, Radovanovic M, Siric Z, Stefanovic V, Perovic S. Long-term functional outcome of kidneys in children with urolithiasis after ESWL treatment. *Eur J Pediatr Surg* 2002; 12: 118-23.
54. Muslumanoglu AY, Tefekli A, Sarilar O, Binbay M, Altunrende F, Ozkuvanci U. Extracorporeal shock wave lithotripsy as first line treatment alternative for urinary tract stones in children: a large scale retrospective analysis. *J Urol* 2003; 170(6 Pt 1): 2405-8.
55. Ather MH, Noor MA. Does size and site matter for renal stones up to 30-mm in size in children treated by extracorporeal lithotripsy? *Urology* 2003; 61: 212-5.
56. Ugur G, Erhan E, Kocabas S, Ozyar B. Anaesthetic/analgesic management of extracorporeal shock wave lithotripsy in paediatric patients. *Paediatr Anaesth* 2003; 13: 85-7.
57. Gofrit ON, Pode D, Meretyk S, Katz G, Shapiro A, Golijanin D, et al. Is the pediatric ureter as efficient as the adult ureter in transporting fragments following extracorporeal shock wave lithotripsy for renal calculi larger than 10 mm? *J Urol* 2001; 166: 1862-4.
58. Ozgur Tan M, Karaoglan U, Sozen S, Bozkirli I. Extracorporeal shock-wave lithotripsy for treatment of ureteral calculi in paediatric patients. *Pediatr Surg Int* 2003; 19: 471-4.
59. Demirkesen O, Onal B, Tansu N, Altintas R, Yalcin V, Oner A. Efficacy of extracorporeal shock wave lithotripsy for isolated lower caliceal stones in children compared with stones in other renal locations. *Urology* 2006; 67: 170-4.
60. Ozgur Tan M, Karaoglan U, Sen I, Deniz N, Bozkirli I. The impact of radiological anatomy in clearance of lower calyceal stones after shock wave lithotripsy in paediatric patients. *Eur Urol* 2003; 43: 188-93.
61. Onal B, Demirkesen O, Tansu N, Kalkan M, Altintas R, Yalcin V. The impact of caliceal pelvic anatomy on stone clearance after shock wave lithotripsy for pediatric lower pole stones. *J Urol* 2004; 172: 1082-6.
62. Tan AH, Al-Omar M, Watterson JD, Nott L, Denstedt JD, Razvi H. Results of shockwave lithotripsy for pediatric urolithiasis. *J Endourol* 2004; 18: 527-30.
63. Lottmann HB, Traxer O, Archambaud F, Mercier-Pageyral B. Monotherapy extracorporeal shock wave lithotripsy for the treatment of staghorn calculi in children. *J Urol* 2001; 165(6 Pt 2): 2324-7.

64. Al-Busaidy SS, Prem AR, Medhat M. Pediatric staghorn calculi: the role of extracorporeal shock wave lithotripsy monotherapy with special reference to ureteral stenting. *J Urol* 2003; 169: 629-33.
65. Rodrigues-Netto N Jr, Longo JA, Ikonomidis JA, Rodrigues Netto M. Extracorporeal shock wave lithotripsy in children. *J Urol* 2002; 167: 2164-6.
66. Afshar K, McLorie G, Papanikolaou F, Malek R, Harvey E, Pippi-Salle JL, et al. Outcome of small residual stone fragments following shock wave lithotripsy in children. *J Urol* 2004; 172(4 Pt 2): 1600-3.
67. Tan MO, Kirac M, Onaran M, Karaoglan U, Deniz N, Bozkirli I. Factors affecting the success rate of extracorporeal shock wave lithotripsy for renal calculi in children. *Urol Res* 2006; 34: 215-21.
68. Newman DM, Lingeman JE. Management of upper urinary tract calculi with extracorporeal shock wave lithotripsy. *Compr Ther* 1989; 15: 35-40.
69. Khaitan A, Gupta NP, Hemal AK, Dogra PN, Seth A, Aron M. Post-ESWL, clinically insignificant residual stones: reality or myth? *Urology* 2002; 59: 20-4.
70. Fine JK, Pak CY, Preminger GM. Effect of medical management and residual fragments on recurrent stone formation following shock wave lithotripsy. *J Urol* 1995; 153: 27-33.
71. Cicerello E, Merlo F, Gambaro G, Maccatrozzo L, Fandella A, Baggio B, et al. Effect of alkaline citrate therapy on clearance of residual renal stone fragments after extracorporeal shock wave lithotripsy in sterile calcium and infection nephrolithiasis patients. *J Urol* 1994; 151: 5-9.
72. Soygur T, Akbay A, Kupeli S. Effect of potassium citrate therapy on stone recurrence and residual fragments after shock wave lithotripsy in lower caliceal calcium oxalate urolithiasis: a randomized controlled trial. *J Endourol* 2002; 16: 149-52.
73. Strem SB, Yost A, Mascha E. Clinical implications of clinically insignificant stone fragments after extracorporeal shock wave lithotripsy. *J Urol* 1996; 155: 1186.
74. Tan AH, Al-Omar M, Watterson JD, Nott L, Denstedt JD, Razvi H. Results of shockwave lithotripsy for pediatric urolithiasis. *J Endourol* 2004; 18: 527-30.
75. Wu HY, Docimo SG. Surgical management of children with urolithiasis. *Urol Clin North Am* 2004; 31: 589-94.
76. Woodside JR, Stevens GF, Stark GL, Borden TA, Ball WS. Percutaneous stone removal in children. *J Urol* 1985; 134: 1166-7.
77. Jackman SV, Hedican SP, Peters CA, Docimo SG. Percutaneous nephrolithotomy in infants and preschool age children: experience with a new technique. *Urology* 1998; 52: 697-701.
78. Sahin A, Tekgul S, Erdem E, Ekici S, Hascicek M, Kendi S. Percutaneous nephrolithotomy in older children. *J Pediatr Surg* 2000; 35: 1336-8.
79. Shokeir AA, El-Nahas AR, Shoma AM, Eraky I, El-Kenawy M, Mokhtar A, et al. Percutaneous nephrolithotomy in treatment of large stones within horseshoe kidneys. *Urology* 2004; 64: 426-9.

80. Boormans JL, Scheepe JR, Verkoelen CF, Verhagen PC. Percutaneous nephrolithotomy for treating renal calculi in children. *BJU Int* 2005; 95: 631-4.
81. Dawaba MS, Shokeir AA, Hafez A, Shoma AM, El-Sherbiny MT, Mokhtar A, et al. Percutaneous nephrolithotomy in children: early and late anatomical and functional results. *J Urol* 2004; 172: 1078-81.
82. Desai MR, Kukreja RA, Patel SH, Bapat SD. Percutaneous nephrolithotomy for complex pediatric renal calculus disease. *J Endourol* 2004; 18: 23-7.
83. Badawy H, Salama A, Eissa M, Kotb E, Moro H, Shoukri I. Percutaneous management of renal calculi: experience with percutaneous nephrolithotomy in 60 children. *J Urol* 1999; 162: 1710-3.
84. Salah MA, Tallai B, Holman E, Khan MA, Toth G, Toth C. Simultaneous bilateral percutaneous nephrolithotomy in children. *BJU Int* 2005; 95: 137-9.
85. Nouralizadeh A, Basiri A, Javaherforooshzadeh A, Soltani MH, Tajali F. Experience of percutaneous nephrolithotomy using adult-size instruments in children less than 5 years old. *J Pediatr Urol* 2009; 5: 351-4.
86. Unsal A, Resorlu B, Kara C, Bozkurt OF, Ozyuvali E. Safety and efficacy of percutaneous nephrolithotomy in infants, preschool age, and older children with different sizes of instruments. *Urology* 2010; 76: 247-52.
87. Khairy Salem H, Morsi HA, Omran A, Daw MA. Tubeless percutaneous nephrolithotomy in children. *J Pediatr Urol* 2007; 3: 235-8.
88. Dogan HS, Kilicarslan H, Kordan Y, Celen S, Oktay B. Percutaneous nephrolithotomy in children: does age matter? *World J Urol* 2011; 29: 725-9.
89. Guven S, Istanbuluoglu O, Gul U, Ozturk A, Celik H, Aygun C, et al. Successful percutaneous nephrolithotomy in children: multicenter study on current status of its use, efficacy and complications using Clavien classification. *J Urol* 2011; 185: 1419-24.
90. Ozden E, Mercimek MN, Yakupoglu YK, Ozkaya O, Sarikaya S. Modified Clavien classification in percutaneous nephrolithotomy: assessment of complications in children. *J Urol* 2011; 185: 264-8.
91. Ozden E, Sahin A, Tan B, Dogan HS, Eren MT, Tekgul S. Percutaneous renal surgery in children with complex stones. *J Pediatr Urol* 2008; 4: 295-8.
92. Bilen CY, Gunay M, Ozden E, Inci K, Sarikaya S, Tekgul S. Tubeless mini percutaneous nephrolithotomy in infants and preschool children: a preliminary report. *J Urol* 2010; 184: 2498-502.
93. Cannon GM, Smaldone MC, Wu HY. Ureteroscopic management of lower-pole stones in a pediatric population. *J Endourol* 2007; 21: 1179-82.
94. Jackman SV, Docimo SG, Cadeddu JA, Bishoff JT, Kavoussi LR, Jarrett TW. The "mini-perc" technique: a less invasive alternative to percutaneous nephrolithotomy. *World J Urol* 1998; 16: 371-4.
95. Zeren S, Satar N, Bayazit Y, Bayazit AK. Percutaneous nephrolithotomy in the management of pediatric renal calculi. *J Endourol* 2002; 16: 75-78.

96. Bilen CY, Kocak B, Kitirci G, Ozkaya O, Sarikaya S. Percutaneous nephrolithotomy in children: lessons learned in 5 years at a single institution. *J Urol* 2007; 177: 1867-71.
97. Desai MR, Sharma R, Mishra S, Sabnis RB, Stief C, Bader M. Single-step percutaneous nephrolithotomy (microperc): the initial clinical report. *J Urol* 2011; 186: 140-5.
98. Aghamir SM, Salavati A, Aloosh M, Farahmand H, Meysamie A, Pourmand G. Feasibility of totally tubeless percutaneous nephrolithotomy under the age of 14 years: a randomized clinical trial. *J Endourol* 2012; 26: 621-4.
99. Ritchey M, Patterson DE, Kelalis PP, Segura JW. A case of pediatric ureteroscopic lasertripsy. *J Urol* 1988; 139: 1272-4.
100. Shepherd P, Thomas R, Harmon EP. Urolithiasis in children: innovations in management. *J Urol* 1988; 140: 790-2.
101. Hill DE, Segura JW, Patterson DE, Kramer SA. Ureteroscopy in children. *J Urol* 1990; 144: 481-3.
102. Caione P, De Gennaro M, Capozza N, Zaccara A, Appetito C, Lais A, et al. Endoscopic manipulation of ureteral calculi in children by rigid operative ureterorenoscopy. *J Urol* 1990; 144(2 Pt 2): 484-5.
103. Minevich E, Defoor W, Reddy P, Nishinaka K, Wacksman J, Sheldon C, et al. Ureteroscopy is safe and effective in prepubertal children. *J Urol* 2005; 174: 276-9.
104. Soygur T, Zumurubas AE, Gulpinar O, Suer E, Arikan N. Hydrodilation of the ureteral orifice in children renders ureteroscopic access possible without any further active dilation. *J Urol* 2006; 176: 285-7.
105. Schuster TG, Russell KY, Bloom DA, Koo HP, Faerber GJ. Ureteroscopy for the treatment of urolithiasis in children. *J Urol* 2002; 167: 1813-6.
106. Richter S, Shalev M, Lobik L, Buchumensky V, Nissenkorn I. Early post-ureteroscopy vesicoureteral reflux--a temporary and infrequent complication: prospective study. *J Endourol* 1999; 13: 365-6.
107. Menezes P, Dickinson A, Timoney AG. Flexible ureterorenoscopy for the treatment of refractory upper urinary tract stones. *BJU Int* 1999; 84: 257.
108. Michel MS, Knoll T, Ptaschnyk T, Kohrmann KU, Alken P. Flexible ureterorenoscopy for the treatment of lower pole calyx stones: influence of different lithotripsy probes and stone extraction tools on scope deflection and irrigation flow. *Eur Urol* 2002; 41: 312.
109. Troy AJ, Anagnostou T, Tolley DA. Flexible upper tract endoscopy. *BJU Int* 2004; 93: 671.
110. Anagnostou T, Tolley D. Management of ureteric stones. *Eur Urol* 2004; 45: 714-21.
111. Elbahnasy AM, Shalhav AL, Hoenig DM, Elashry OM, Smith DS, McDougall EM, et al. Lower caliceal stone clearance after shock wave lithotripsy or ureteroscopy: the impact of lower pole radiographic anatomy. *J Urol* 1998; 159: 676-82.

112. Afane JS, Olweny EO, Bercowsky E, Sundaram CP, Dunn MD, Shalhav AL, et al. Flexible ureteroscopes: a single center evaluation of the durability and function of the new endoscopes smaller than 9Fr. *J Urol* 2000;164: 1164-8.
113. Akpınar H, Tufek I, Alici B, Kural AR. Ureteroscopy and holmium laser lithotripsy in pregnancy: stents must be used postoperatively. *J Endourol* 2006; 20: 107-10.
114. Beiko DT, Denstedt JD. Advances in ureterorenoscopy. *Urol Clin N Am* 2007; 34: 397-408.
115. Bultitude MF, Tiptaft RC, Dasgupta P, Glass JM. Treatment of urolithiasis in the morbidly obese. *Obes Surg* 2004; 14: 300-4.
116. Dash A, Schuster TG, Hollenbeck BK, Faerber GJ, Wolf JS Jr. Ureteroscopic treatment of renal calculi in morbidly obese patients: a stone-matched comparison. *Urology* 2002; 60: 393-7.
117. Minevich E, Sheldon CA. The role of ureteroscopy in pediatric urology. *Curr Opin Urol* 2006; 16: 295-8.
118. Raza A, Smith G, Moussa S, Tolley D. Ureteroscopy in the management of pediatric urinary tract calculi. *J Endourol* 2005; 19: 151-8.
119. Tan AH, Al-Omar M, Denstedt JD, Razvi H. Ureteroscopy for pediatric urolithiasis: an evolving first-line therapy. *Urology* 2005; 65: 153-6.
120. Chiu KY, Cai Y, Marcovich R, Smith AD, Lee BR. Are new-generation flexible ureteroscopes better than their predecessors? *BJU Int* 2004; 93: 115-9.
121. Hobenfellner R. Ureterorenoscopy in: *Manual Endourology Training for Residents*. Heidelberg, Germany. Springer Medizin Verlag 2005; 12: 105-18.
122. Van Savage JG, Palanca LG, Andersen RD, Rao GS, Slaughenhoupt BL. Treatment of distal ureteral stones in children: similarities to the american urological association guidelines in adults. *J Urol* 2000; 164(3 Pt 2): 1089-93.
123. Bassiri A, Ahmadnia H, Darabi MR, Yonessi M. Transureteral lithotripsy in pediatric practice. *J Endourol* 2002; 16: 257-60.
124. Satar N, Zeren S, Bayazit Y, Aridoğan IA, Soyupak B, Tansuğ Z. Rigid ureteroscopy for the treatment of ureteral calculi in children. *J Urol* 2004; 172: 298-300.
125. De Dominicis M, Matarazzo E, Capozza N, Collura G, Caione P. Retrograde ureteroscopy for distal ureteric stone removal in children. *BJU Int* 2005; 95: 1049-52.
126. Dogan HS, Tekgul S, Akdogan B, Keskin MS, Sahin A. Use of the holmium:YAG laser for ureterolithotripsy in children. *BJU Int* 2004; 94: 131-3.
127. Grasso M, Chalik Y. Principles and applications of laser lithotripsy: experience with the holmium laser lithotrite. *J Clin Laser Med Surg* 1998; 16: 3-7.
128. Tanaka ST, Makari JH, Pope JC 4th, Adams MC, Brock JW 3rd, Thomas JC. Pediatric ureteroscopic management of intrarenal calculi. *J Urol* 2008; 180: 2150-3.
129. Dave S, Khoury AE, Braga L, Farhat WA. Single-institutional study on role of ureteroscopy and retrograde intrarenal surgery in treatment of pediatric renal calculi. *Urology* 2008; 72: 1018-21.

130. Kim SS, Kolon TF, Canter D, White M, Casale P. Pediatric flexible ureteroscopic lithotripsy: the children's hospital of Philadelphia experience. *J Urol* 2008; 180: 2616-9.
131. Corcoran AT, Smaldone MC, Mally D, Ost MC, Bellinger MF, Schneck FX, et al. When is prior ureteral stent placement necessary to access the upper urinary tract in prepubertal children? *J Urol* 2008; 180(4 Suppl): 1861-3.
132. Abu Ghazaleh LA, Shunaigat AN, Budair Z. Retrograde intrarenal lithotripsy for small renal stones in prepubertal children. *Saudi J Kidney Dis Transpl* 2011; 22: 492-6.
133. Desai MR, Patel SB, Desai MM, Kukreja R, Sabnis RB, Desai RM, et al. The Dretler stone cone: a device to prevent ureteral stone migration-the initial clinical experience. *J Urol* 2002; 167: 1985-8.
134. Zheng W, Denstedt JD. Intracorporeal lithotripsy. Update on technology. *Urol Clin North Am* 2000; 27: 301-13.
135. Knopf HJ, Graff HJ, Schulze H. Perioperative antibiotic prophylaxis in ureteroscopic stone removal. *Eur Urol* 2003; 44: 115-8.
136. Casale P, Grady RW, Joyner BD, Zeltser IS, Kuo RL, Mitchell ME. Transperitoneal laparoscopic pyelolithotomy after failed percutaneous access in the pediatric patient. *J Urol* 2004; 172: 680-3.
137. Lee RS, Passerotti CC, Cendron M, Estrada CR, Borer JG, Peters CA. Early results of robot assisted laparoscopic lithotomy in adolescents. *J Urol* 2007; 177: 2306-9.
138. Gofrit ON, Pode D, Meretyk S, Katz G, Shapiro A, Golijanin D, et al. Is the pediatric ureter as efficient as the adult ureter in transporting fragments following extracorporeal shock wave lithotripsy for renal calculi larger than 10 mm. *J Urol* 2001; 166: 1862-4.
139. Bassiri A, Ahmadnia H, Darabi MR, Yonessi M. Transureteral lithotripsy in pediatric practice. *J Endourol* 2002; 16: 257-60.
140. Azili M N, O Fatma, T Tugrul. Reterograde intrarenal surgery for treatment of renal stones in children: Factors influencing stone clearance and complications. *J Pediat Surg* 2014; 49: 1161-5.
141. Bassiri A, Ahmadnia H, Darabi MR, Yonessi M. Transureteral lithotripsy in pediatric practice. *J Endourol* 2002; 16: 257.
142. Erturhan S, Yağci F, Sarica K. Ureteroscopic management of ureteral calculi in children. *J Endourol* 2007; 21: 397-400.
143. Smaldone MC, Cannon GM Jr, Wu HY, Bassett J, Polsky EG, Bellinger MF, et al. Is ureteroscopy first line treatment for pediatric stone disease? *J Urol* 2007; 178: 2128-31.
144. Lesani OA, Palmer JS. Retrograde proximal rigid ureteroscopy and pyeloscopy in prepubertal children: safe and effective. *J Urol* 2006; 176: 1570-3.
145. Smaldone MC, Corcoran AT, Docimo SG, Ost MC. Endourological management of pediatric stone disease: Present status. *J Urol* 2009; 181: 17-28.

146. Minevich E, Sheldon CA. The role of ureteroscopy in pediatric urology. *Current Opinion in Urol* 2006; 16: 295-298.
147. Resorlu B, Unsal A, Tepeler A, Atis G, Tokatli Z, Oztuna D, et al. comparison of Reterograde Intrarenal surgery and mini-Percutaneous Nephrolithotomy in children with moderate size kidney stones: results of multi-institutional analysis. *Urol* 2012; 80: 519-23.
148. Smaldone MC, Docimo SG, Ost MC. Contemporary surgical management of pediatric urolithiasis. *J Pediatr Urol* 2010; 37: 253-267.
149. Unsal A, Resorlu B. Reterograde intrarenal surgery in infants and preschool age children. *J Pediatr Surg* 2011; 46: 2195-9.
150. Tan AH, Al-Omar M, Denstedt JD, Razvi H. Ureteroscopy for pediatric urolithiasis: an evolving first-line therapy. *Urol* 2005; 65: 153-6.
151. Gamal W, Aldahshoury M, Hammady A. Stentless pediatric ureteroscopic holmium: YAG laser stone disintegration: is gravels retrieval an issue? *J Urol and Nephrol* 2011; 43: 613-617.
152. Kurzrock EA, Huffman JL, Hardy BE, Fugelso P. Endoscopic treatment of pediatric urolithiasis. *J Pediatr Surg* 1996; 31: 1413-6.
153. Thomas R, Ortenberg J, Lee BR, Harmon EP. Safety and efficacy of pediatric ureteroscopy for management of calculous disease. *J Urol* 1933; 149: 1082-4.
154. Herndon CDA, Viamonte L, Joseph DB. Ureteroscopy in children: is there a need for ureteral dilation and postoperative stenting? *J Ped Urol* 2006; 2: 290-3.
155. Straub M, Gschwend J, Zom C. Pediatric urolithiasis: the current surgical management. *J Pediatr Nephrol* 2010; 25: 1239-1244.
156. Fuchs GJ, Yurkanin JP. Endoscopic surgery for renal calculi. *J Current Opinion in Urol* 2003; 13: 143-247.
157. Bassiri A, Ahmadnia H, Darabi MR, Yonessi M. Transureteral lithotripsy in pediatric practice. *J Endourol* 2002; 16: 257.
158. Ozden E, Sahin A, Tan B, Doğan HS, Eren MT, Tekgül S. Percutaneous renal surgery in children with complex stones. *J Pediatr Urol* 2008; 4: 295-8.
159. Bozkurt OF, Resorlu B, Yildiz Y, Can CE, Unsal A. Retrograde intrarenal surgery versus percutaneous nephrolithotomy in the management of lower pole renal stones with diameter of 15 to 20 mm. *J Endourol* 2011; 25: 1131-5.
160. Akman T, Binbay M, Ugurlu M, Kaba M, Akcay M, Yazici O, et al. Outcomes of retrograde intrarenal surgery compared with percutaneous nephrolithotomy in elderly patients with moderate size kidney stones: a matched pair analysis. *J Endourol* 2012; 26: 625-9.
161. Tander B, Baris S, Karakaya D, Ariturk E, Rizalar R, Bernay F. Risk factors influencing inadvertent hypothermia in infants and neonates during anesthesia. *Paediatr Anaesth* 2005; 15: 574-9.
162. Bilen CY, Koçak B, Kitirci G, Ozkaya O, Sarikaya S. Percutaneous nephrolithotomy in children: lessons learned in 5 years at a single institution. *J Urol* 2007; 177: 1867-71.

163. Vorrakitpokatorn P, Permtongchuchai K, Raksamani EO, Phettongkam A. Perioperative complications and risk factors of percutaneous nephrolithotomy. *J Med Assoc Thai* 2006; 89: 826-33.
164. Muslumanoglu AY, Tefekli AH, Altunrende F, Karadag MA, Baykal M, Akcay M. Efficacy of extracorporeal shock wave lithotripsy for ureteric stones in children. *Int Urol Nephrol* 2006; 38: 225-9.
165. Elsobky E, Sheir KZ, Madbouly K, Mokhtar AA. Extracorporeal shock wave lithotripsy in children: experience using two second-generation lithotripters. *BJU Int* 2000; 86: 851-6.
166. Keeley FX, Moussa SA, Smith G, Tolley DA. Clearance of lower-pole stones following shock wave lithotripsy: effect of infundibulopelvic angle. *Eur Urol* 1999; 36: 371-5.
167. Pearle MS, Lingeman JE, Leveillee R, Kuo R, Preminger GM, Nadler RB, et al. Prospective, randomized trial comparing shock wave lithotripsy and ureteroscopy for lower pole caliceal calculi 1 cm or less. *J Urol* 2005; 173: 2005-9.
168. Muslumanoglu AY, Tepeler A, Binbay M. Does previous Extracorporeal shock wave lithotripsy affect the performance and outcome of percutaneous nephrolithotomy?. *J Urol* 2009; 181: 663-667.
169. Sigman M, Laudone VP, Jenkins AD, Howards SS, Riehle R Jr, Keating MA, et al. Initial experience with extra corporeal shock wave lithotripsy in children. *J Urol* 1987; 138: 839-43.

PROTOCOL

ASSESSMENT OF SAFETY AND EFFICACY OF FLEXIBLE URETERORENOSCOPY FOR THE MANAGEMENT OF UPPER URINARY TRACT UROLITHIASIS IN CHILDREN

تقييم أمان وكفاءة استخدام منظار الحالب المرن في علاج حصوات الجزء العلوي من الجهاز البولي (الحالب والكلي) عند الاطفال

Protocol of a thesis submitted
to the Faculty of Medicine
University of Alexandria
In partial fulfillment of the
requirements of the degree of
Master of Genitourinary Surgery

خطة بحث مقدمة
لكلية الطب
جامعة الإسكندرية
إيفاءً جزئياً
لشروط الحصول على درجة
الماجستير في جراحة المسالك البولية والتناسلية

by

من

Mostafa Said Taha Moussa

MBBCh, Alex.

Resident

Alexandria University Hospitals

Department of Genitourinary Surgery

Faculty of Medicine

University of Alexandria

2012

مصطفى سعيد طه موسى

بكالوريوس الطب والجراحة ، الإسكندرية

طبيب مقيم

مستشفيات جامعة الإسكندرية

قسم جراحة المسالك البولية والتناسلية

كلية الطب

جامعة الإسكندرية

٢٠١٢

SUPERVISORS

المشرفون

Prof. Dr. Ebrahim Abd-Elsalam Mokhles

Professor of Genitourinary System,
Faculty of Medicine,
University of Alexandria.

أ.د/ ابراهيم عبدالسلام مخلص
أستاذ جراحة المسالك البولية والتناسلية
كلية الطب
جامعة الإسكندرية

Dr. Abd-Elrahman Mahmoud Zahran

Assistant Professor of Genitourinary
System,
Faculty of Medicine,
University of Alexandria.

د/ عبد الرحمن محمود زهران
أستاذ مساعد جراحة المسالك البولية
والتناسلية
كلية الطب
جامعة الإسكندرية

CO-SUPERVISOR

المشرف المشارك

Dr. Hussein Mamdouh Abd-Eldayem

Lecturer in Genitourinary System,
Faculty of Medicine,
University of Alexandria.
For his experience in flexible ureteroscopy.

د/ حسين ممدوح عبد الدايم
مدرس جراحة المسالك البولية
كلية الطب
جامعة الإسكندرية
وذلك لخبرته في منظار الحالب المرن

ASSISTANT-RESEARCHER

Shaban Mohsen Shaban

6th grade student

Faculty of Medicine,
University of Alexandria.

Mobile phone: 0129013330

E-mail: Shaban-Mohsen@hotmail.com

الباحث المساعد

شعبان محسن شعبان

طالب بالفرقة السادسة

كلية الطب

جامعة الاسكندرية

INTRODUCTION

Urolithiasis in childhood is rare in the developed world, representing 1% to 5% of all urinary tract stones.⁽¹⁾ However, in developing countries, the occurrence of pediatric urolithiasis is 30% of all urinary tract stones.⁽²⁻³⁾

Many therapeutic options are available for the management of upper urinary tract stones in children, including shock wave lithotripsy, percutaneous nephrolithotomy and ureteroscopic treatment.⁽⁴⁾ While these treatment options have become the standard of care in the adult population, this is not the same in pediatric population despite an increasing prevalence of stone disease in children.⁽⁵⁾

In the last decade, technological advancement and miniaturization of instruments have changed the management of urinary stone disease. Since the initial report, percutaneous nephrolithotomy (PCNL) has become accepted as a well-established, minimally invasive procedure in children and adults. However, PCNL may present problems in infants and preschool-age children because of the small size and mobility of the pediatric kidney, friable renal parenchyma, and the small size of the collecting system.⁽⁶⁾

With increasing experience of retrograde intrarenal surgery in adults,⁽⁷⁾ recently, a few reports of successful ureterorenoscopic management of renal stones in children have been published.⁽⁸⁾ However, most of those reports include a significant number of older adolescents. In children, small-volume; non stag horn stones can be effectively managed with the retrograde intrarenal surgery with good outcomes without the need for open surgery or PCNL.⁽⁹⁾

To our knowledge, there are few reports specifically addressing the efficacy of retrograde endoscopic management of intrarenal calculi in the preschool-age children.⁽¹⁰⁾

Stone disease in very young children is often associated with anatomical and metabolic abnormalities or infectious diseases, and the risk of recurrence is

high. These factors make minimally invasive procedures more important in this age group.⁽¹¹⁾

Advances in the design of ureteroscopes and ancillary instruments during the last 15 years have resulted in miniaturization and increased durability of the smaller scopes required for pediatric patients.⁽¹²⁻¹³⁾

Enhancements in video technology coupled with improved optics have increased the ability of the pediatric urologist to evaluate and treat endoscopically the urinary tract in even the smallest patients.⁽¹⁴⁻¹⁵⁾ However further studies with larger number of patients is required to evaluate the role of flexible ureterorenoscopy in the management of upper tract urolithiasis in children.⁽¹⁶⁻¹⁷⁾

AIM OF THE WORK

The aim of this work is to assess the efficacy and safety of flexible ureterorenoscopy for the management of upper urinary tract urolithiasis in children.

PATIENTS

This study will be conducted on 20 children with upper urinary tract stones.

Inclusion criteria:

1. Impacted upper ureteric stones.
2. Renal stones more than 7mm.
3. Failed Extracorporeal Shock Wave Lithotripsy or contraindication to ESWL.

Exclusion criteria:

1. Presence of distal obstruction to the stone.
2. Urinary stone more than 2cm and / or stag-horn stones.

METHODS

1. All patients will be evaluated preoperatively by:
 - Complete history taking.
 - Complete physical examination.
 - Routine laboratory investigation and coagulation profile.
 - Urine culture and sensitivity; if there is infection appropriate antibiotic will be given to sterilize urine before intervention.
 - The site number and size of stone will be determined by:
 - Ultrasound kidneys and bladder.
 - Plain X-ray Kidney Ureter Bladder.
 - Low radiation dose non contrast multislice CT abdomen and pelvis.

After of an informed consent is signed by the parent explaining possible outcome and possible complications of the procedure all children will be treated by flexible renoureteroscopy and holmium laser lithotripsy under general anesthesia, with placement of ureteric stent.

2. Intraoperative evaluation of the procedure will include:
 - Operative time.
 - Laser energy used.
 - Radiation exposure time.
 - Intraoperative complications.
3. Postoperative evaluation will include:
 - Plain KUB.

- Ultrasound abdomen and pelvis.
- Analgesic requirement.
- Postoperative complications.
- Hospital stay.

4. All patients will be followed up a minimum of six months by:

- History taking with special emphasis on pain, fever and haematuria.
- Clinical examination.
- Urine culture and sensitivity.
- Plain X-ray abdomen and pelvis.
- Ultrasound abdomen and pelvis.

RESULTS

The results of this work will be tabulated and statistical analysis of data will be performed.

DISCUSSION

The results of this study will be discussed and compared with those of other workers in the same field.

REFERENCES

1. Thomas JC, McMarco RT, Donoboe JM. pediatric ureteroscopic stone management. J Urol 2005; 174:1072-4.
2. Holman E, Flasko T, Toth C. Endoscopic management of pediatric urolithiasis in a developing country. Urol 2004; 63:159-62,.
3. Sarkissian A, Babloyan A, Arikants N. Pediatric urolithiasis in Armenia: a study of 198 patients observed from 1991 to 1999. Pediatr Nephrol 2001; 16: 728-32.
4. Kim SS, Kolon TF, Canter D. Pediatric flexible ureteroscopic lithotripsy: the children's hospital of Philadelphia experience. J Urol 2008; 180:2616-9.
5. Ozden E, Sahin A, Tan B. Percutaneous renal surgery in children with complex stones. J Pediat Urol 2008; 4:295-8.
6. Cannon GM, Smaldone MC, Wu HY. Ureteroscopic management of lower-pole stones in a pediatric population. J Endourol 2007; 21:1179-82.
7. Breda A, Ogunemi O, Leppert JT. Flexible ureteroscopy and laser lithotripsy for multiple unilateral intrarenal stones. J Urol 2009; 55:1190-7.
8. Unsal A, Resorlu B. Reterograde intrarenal surgery in infants and preschool-age children. J Pediat Surg 2011; 45:2195-9.

9. Dave S, Khoury AE, Braga L. Single-institutional study on role of ureteroscopy and retrograde intrarenal surgery in treatment of pediatric renal calculi. *Urology* 2008; 72:1018-21.
10. Tanaka ST, Makari JH, Pope JC. Pediatric ureteroscopic management of intrarenal calculi. *J Urol* 2008; 180:2150-4.
11. Unsal A, Resorlu B, Kara C. Safety and efficacy of percutaneous nephrolithotomy in infants, preschool age, and older children with different size of instruments. *Urolog* 2010; 76:247-53.
12. Raza A, Tuma B, Smith G. Pediatric urolithiasis: 15 years of local experience with minimally invasive endourological management of pediatric calculi. *J Urol* 2005; 174: 682-5.
13. Minevich E, Reddy P, Nishinaka K. Ureteroscopy is safe and effective in prepubertal children. *J Urol* 2005; 174:276-9.
14. Smaldone MC, Corcoran AT, Docimo SG. Endourological management of pediatric stone disease: present status. *J Urol* 2009; 181:17-28.
15. Minevich E. Management of ureteric stone in pediatric patients. *Indian J Urol* 2010; 26:564-7.
16. Bassiri A, Ahmadnia H, Darabi MR. Transureteral lithotripsy in pediatric practice. *J Endourol* 2002; 16:257.
17. Schuster TG, Russell KY, Bloom DA. J Ureteroscopy for the treatment of urolithiasis in children. *J Urol* 2002; 167:1813.

ARABIC SUMMARY

الملخص العربي

حصوات الكلي في مرحلة الطفولة نادرة الحدوث في العالم المتقدم، وهي تمثل ١٪ إلى ٥٪ من جميع الحصوات بالجهاز البولي. ومع ذلك، في البلدان النامية، فإن نسبة حدوث حصوات الكلي عند الأطفال هي ٣٠٪ من حصوات الجهاز البولي.

انخفاض معدلات تكوين الحصوات عند الأطفال، وارتفاع معدل إزالة الشظايا الناتجة عن تفتيت الحصوات بالموجات التصادمية في الاطفال والمخاوف بشأن استخدام منظار الحالب الكبير في الحالب ذي العيار الصغير هي العوامل التي تسببت في تخلف اعتماد منظار الحالب لعلاج الحصوات عند الأطفال عن البالغين.

مع انتاج مناظير حالب شبه صلبة صغيرة الحجم والأدوات المساعدة لها، أصبح منظار الحالب خيارا أكثر جاذبية لعلاج حصوات الحالب عند الأطفال. وقد أدى نجاحه في علاج حصوات الحالب السفلي لتوسيع فائدته لعلاج حصوات المسالك العليا.

في هذه الدراسة، قمنا بتقييم مستقبلي لتجربتنا مع استخدام منظار الحالب المرن في علاج حصوات الجزء العلوي من الجهاز البولي (الحالب والكلي) عند الاطفال في قسم المسالك جامعة الاسكندرية.

خضع عشرون طفلا (٢٤ وحدة كلوية) لجراحة تصاعدية داخل الكلي لعلاج حصوات الكلي في هذه الدراسة. وقد تمت الدراسة باستخدام كل من منظار الحالب شبه الصلب و منظار الحالب المرن. وقد تم توسيع فتحة الحالب بواسطة ضغط الماء فقط وتجنب اية توسعة ميكانيكية. تم تفتيت الحصوات في مكانها باستخدام الليزر بدون اي محاولة لاستخراج شظايا الحصوات. في النهاية تم وضع دعامات الحالب في جميع المرضى.

وكانت معدلات نجاح علاج الحصوات بالكأس العلوي بالكلي، والكأس الوسطي بالكلي وحصوات الحالب العليا ١٠٠٪ بعد جلسة واحدة من الجراحة التصاعدية داخل الكلي و معدلات نجاح علاج الحصوات بالكأس السفلي بالكلي ٥٠٪ و ٧٦.٩٪ للحصوات بحوض الكلي بعد جلسة واحدة من الجراحة التصاعدية داخل الكلي. كان معدل نجاح علاج الحصوات بعد جلسة واحدة من الجراحة التصاعدية داخل الكلي ٨٠٪ وارتفعت إلى ٩٥٪ بعد الجلسة الثانية.

في الدراسة الحالية، وجد ان كل المضاعفات حدثت في بداية الدراسة. نحن لم نواجه أي حالة حدوث سلخ بالحالب، كان هناك حالة واحدة حدثت بها إصابة جزئية بجدار الحالب مع عدم وجود تسرب خارجي وتم علاجها بوضع دعامة بالحالب، وكان هناك اثنان من الحالات التي عانت من حمى بعد العملية الجراحية تمت معالجتها تحفظيا.

أيضا، لم تكن هناك حالات التهاب المسالك البولية بعد العمل الجراحي الذي يمكن أن يعزى إلى حجم الحصى الصغيرة، وعدم توسيع فتحة الحالب ميكانيكيا وبروتوكول تركيب دعامة الحالب في كل المرضى. في هذه الدراسة لم يكن هناك اي حالات هجرة للدعامة بالحالب.

لم يعاني أحد من مرضانا من التهاب كلوي بعد إجراء التدخل. لم يكن هناك أي حدوث انخفاض في حرارة الجسم في مرضانا، لم يحدث امتصاص داخل الأوعية الدموية من المحاليل المستخدمة السابق تدفنتها وكان هناك انتعاش سلس من التخدير. لم يكن هناك أي حالات فقدان الدم بصورة كبيرة أو الحاجة إلى نقل الدم.

وقد أظهرت نتائج دراستنا أن استخدام منظار الحالب المرن هو وسيلة آمنة وفعالة لعلاج حصوات الكلي والحالب العليا عند الأطفال. حيث أنه يقلل المخاطر الناتجة عن العلاج و مدة الإقامة في المستشفى، وبالتالي التكلفة الإجمالية للعلاج.

الملخص العربي

لجنة الإشراف

.....
أ.د/ إبراهيم عبدالسلام مخلص
أستاذ جراحة المسالك البولية والتناسلية
عميد كلية الطب
جامعة الإسكندرية

.....
أ.د/ عبد الرحمن محمود زهران
أستاذ جراحة المسالك البولية والتناسلية
كلية الطب
جامعة الإسكندرية

.....
مشرف مشارك
د/ حسين ممدوح عبد الدايم
مدرس جراحة المسالك البولية
كلية الطب
جامعة الإسكندرية
وذلك لخبرته في منظار الحالب المرن

تقييم أمان وكفاءة استخدام منظار الحالب المرن في علاج حصوات الجزء العلوي من الجهاز
البولي (الحالب والكلي) عند الاطفال

مقدمة من

مصطفى سعيد طه موسى

بكالوريوس الطب والجراحة - جامعة الإسكندرية، ٢٠٠٨

للحصول على درجة

الماجستير

في

جراحة المسالك البولية والتناسلية

موافقون

.....

.....

.....

لجنة المناقشة والحكم على الرسالة

أ.د / أحمد عبد الوهاب ريان
أستاذ جراحة المسالك البولية والتناسلية
كلية الطب
جامعة الإسكندرية

أ.د / إبراهيم عبد السلام مخلص
أستاذ جراحة المسالك البولية والتناسلية
عميد كلية الطب
جامعة الإسكندرية

أ.د / هشام مختار حمودة
أستاذ جراحة المسالك البولية والتناسلية
كلية الطب
جامعة أسيوط



**تقييم أمان وكفاءة استخدام منظار الحالب المرن في علاج حصوات الجزء العلوي من الجهاز
البولي (الحالب والكلي) عند الاطفال**

رسالة علمية

مقدمة إلى كلية الطب - جامعة الإسكندرية
إستيفاء للدراسات المقررة للحصول على درجة

الماجستير

فى

جراحة المسالك البولية والتناسلية

مقدمة من

مصطفى سعيد طه موسى

بكالوريوس الطب والجراحة ، الإسكندرية
طبيب مقيم قسم جراحة المسالك البولية والتناسلية - مستشفيات جامعة الإسكندرية

٢٠١٥