ORIGINAL RESEARCH PAPER

Volume-7 | Issue-9 | September-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

MANAGEMENT OF STEINSTRASSE

Urology

N Srinath* Professor and Head, Department of Urology, Rajarajeswari Medical College, Bangalore India *Corresponding Author

G. S. Sethi Head of Department of Urology, Command Hospital(AF), Bangalore India

ABSTRACT

A retrospective analysis of all cases of steinstrasse and their management was done at our centre over a ten year period. Out of total cases of ESWL at our centre 113(5.6%) developed steinstrasse. Among them 66, 34 and13 had Coptcoat Type I,II, and III steinstrasse respectively. They were grouped into group I (steinstrasse without obstruction or infection) and Group II(Coptcoat Type II/III with obstruction or infection. Group I were treated expectantly or with repeat ESWL. Group II patients underwent ureteroscopic treatment and clearance of stone fragment. One patient with obstruction and urosepsis underwent PCN and later the fragments cleared by ureteroscopy . There was no loss of renal function due to steinstrasse in our study.

KEYWORDS

steinstrasse,ESWL

INTRODUCTION

A steinstrasse(a stone street) is an aggregation of stone particles in ureter seen on plain radiograph after extracorporeal shock wave lithotripsy(ESWL)(Coptcoat MJ et.,al 1986). It is recognized complication of ESWL seen in 1-20% of patients soon after ESWL(Fedullo LM et., al1988). But they are usually transient and asymptomatic. However, they may become static, cause partial or complete obstruction often superimposed with infection requiring intervention.

Steinstrasse can cause a variety of symptoms or a patient can be totally asymptomatic. Renal colic occurs in most of the patients who develop steinstrasse. Pretreatment placement of indwelling ureteric stents in moderate stone burden (aggregate diameter of stone more than 25 mm) may significantly reduce the incidence of symptomatic steinstrasse. Steinstrassen which are asymptomatic or minimally symptomatic can be followed conservatively as long as function of affected renal unit is not impaired. However symptomatic steinstrasse which are longer than 5 cm long require close observation. If obstruction is severe or superimposed with infection, percutaneous nephrostomy allows decompression of kidney and symptomatic improvement.

Various techniques have been used have been used in ureteroscopic breaking of the stones and washing of the debris or the san. Ultrasonic lithotripsy, laser lithotripsy, Swiss lithoclast have been used. Pulsed water irrigation has been used in washing away the debris or the sand. Complicated steinstrasse is a difficult problem to treat and may result in loss of renal function. We discuss the management of steinstrasse at our centre.

PATIENTS AND METHODS

All patients who developed steinstrasse during ESWL therapy for upper urinary tract stones using Dornier electromagnetic lithotripter from 2006 to 2016 were studied. All patients received 3000 shock waves with energy levels up to 4. The interval between the two sessions was usually 2 weeks. Plain X- rays were taken of KUB region after one day at 2 weeks and later as required. Ultrasound examination was done as indicated.

The factors studied were age, sex of the patients, location and size of stone under treatment. Any abnormal anatomical features in IVP which may predispose in the development of steinstrasse was noted. In patients who developed steinstrasse, the location and size of steinstrassse and symptoms due to steinstrasse were noted. The steinstrassen was classified as described by Coptcoat (Type I – all fragments 2 mm or less, Type II- leading fragment of 5mm or more with a tail of 2 mm fragments and Type III- large fragments).

Incidence of pain fever, nausea, vomiting, obstruction was noted. Effect of JJ stenting on development of steinstrasse, on symptoms, management and outcome of steinstrasse was noted.

Patients were grouped into two groups for treatment

Group I- Asymptomatic or moderately symptomatic patients without infection or proximal dilatation were kept under observation. If the Steinstrasse was not progressing ESWL was offered for leading/large fragments. (In case of fever or obstruction they were treated as Group II)

Group II- Steinstrasse with urosepsis or obstruction, severely symptomatic patients, and patients in group I who failed to clear the steinstrasse in 6-8 weeks even after multiple ESWL therapy.

Percutaneous nephrostomy with 8 F pigtail catheter was done under local anaesthesia in patients with severe uro-sepsis and or obstruction. Ureteroscopic removal of stone fragments was done with 8/9.8F or 6 F semirigid ureteroscope. Intraureteric lithotripsy was done by pneumatic lithoclast or Holmium YAG laser. The fragments were removed by 4/6 wire stone baskets if required.

Renal function was studied by Technetium 99m DTPA renal dynamic scans in patients who had significant obstruction. Stone analysis was done my chemical spot tests.

RESULTS

113(5.6%) out of 2004 patients who underwent ESWL therapy for upper urinary tract calculi at tertiary care hospital developed steinstrasse. 74 of these patients were male and 39 were female. 60(53.1%) of them were aged between 20-40 years. 100(88.5%) had renal stone, 9(8%) had ureteric stones and 4 (3.5%) renal and upper ureteric stones. 26(23%) had multiple stones and 87(77%) had single stones. 56(43.3%) patients had aggregate maximum diameter of stone more than 2 cm. The distribution of the size of stones were as shown in table no.1.

Table No. 1

Stone size	No. Of patients
<1 cm	1
1-2 cm	56
2.1-3 cm	42
>3 cm	14

Pre ESWL JJ stenting was done under local anaesthesia in 53 cases(46.9%). Stenting failed in 3 patients. In one there was kink in upper ureter at the level of fourth lumbar vertebra. In the other patients the stent could not be passed beyond the impacted ureteric and pelivi-ureteric junction(PUJ) stones.

Steinstrasse developed 1-2 days after the ESWL session.(Fig No.1) 54 of the patients with steinstrasse without indwelling stent and 26 who had been stented prior to therapy had ureteric colic associated with nausea. Twelve patients developed fever and one patient had high fever with chills and rigors. 66 patients(58.4%) had Type I, 34(30.1%) had Type II and 13(11.5%) had Type III steinstrasse(Coptcoat's classification)

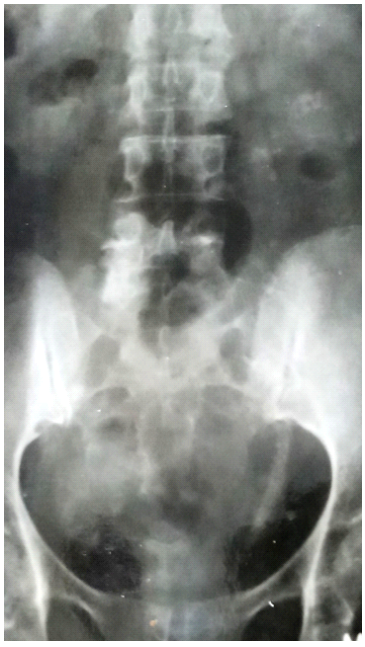

Figure No. 1. Showing steinstrasse in lower ureter(Lt)

TREATMENT

Group I: 112 patients were initially treated conservatively. Among them those patients who had mild to moderately symptomatic with Type I steinstrasse, without infection or upper tract dilatation were kept under observation with weekly plain X-ray KUB and US exam till they cleared the fragments. 40(345.4%) patients passed their stones spontaneously. Patients with Type II and type III steinstrasse with severe symptoms and those in whom the movement of fragment was slow, underwent ESL therapy to the leading/large fragments. 72(62.3%) patients received ESL sessions at an average of 1.6 sessions per steinstrasse. Among these patients in 57 patients who received ESL, steinstrasse cleared on its own.

Group II: At the outset one patient had type III steinstrassen with infection and urosepsis. He underwent PCN followed by subsequent ureteroscopic clearance of steinstrasse.13 patients of group I who did not pass stone fragments were included in this group and five patients among them developed infection. 13 patients underwent ureteroscopic clearance of fragments with JJ stenting. There was no loss of renal function due to steinstrasse in the present series.

JJ stents were put in 53 patients before treatment. Migration of stents were observed in 3 patients which precipitated obstruction due to steinstrasse and required ureteroscopy. Ureteroscopy was required in four patients with pre-ESL stenting as the steinstrasse did not clear even after 6-8 weeks after repeated ESL sessions.

DISCUSSION

Incidence of steninstrasse has been variously described in literature from 1-20% and was 5.65% in present study. With more emphasis on ureterocopic removal of most of distal ureteric stones and treatment of proximal ureteric stones with flexible ureteroscopy and laser lithotripsy the indications for ESWL for uretric stones has decreased. With realisation of poor clearance of stones with ESWL for stones more than 1.5 cm in kidney PCNL is preferred mode of treatment for larger stones. This has led to decreased incidence of steinstrasse as larger stones are no longer treated by ESWL. Retrograde Intrarenal Surgery(RIRS) with better clearance rates has been popular in smaller stones in lower calyces with unfavourable angles.

Most of steinstrasse can be managed conservatively with either observation or repeated ESWL. Those which do not clear in reasonable time or with obstruction and or infection can be very well treated with uretroscopy and intracorporeal laser lithotripsy. JJ stenting prior to ESWL therapy has come down with the decreasing size of stones tackled by ESL. It was observed by C phuken et.al, that patients with Coptcoat Type III steinstrasse with lead fragment more than 5 mm there was significant need of intervention.

Present study showed that steinstrasse can be managed conservatively in majority of cases but a well timed and early intervention in cases with Coptcoat Type III steinstrasse or with obstruction and or infection resulted in prompt clearance and saving renal function.

REFERENCES

1. C Phukan, TJ Nirmal, Cornerstone V wann, J Chandersingh, Santosh Kumar, Nitin S Kekre and Antony Devasia(2017).Can we predict the need for intervention in steinstrasse following shock wave lithotripsy?. Urol Ann, 9(1),51-54.
2. Coptcoat MJ, Welb DR, Kellet MJ, Whitfield HN, Wickham JEA(1986). Complications of ESWL: Management and Prevention. Br J Urol ,58,578-580
3. Coptcoat MJ, Welb DR, Kellet MJ, Whitfield HN, Wickham JE(1988).The steinstrasse: A legacy of extracorporeal lithotripsy? Euro Urol, 14,93-95
4. Fedullo LM, Pollack HM, Banner MD(1988). The development of steinstrasse after ESWL:Frequency, natural history and radiological management. AmJ Rongenol, 151:145.
5. M A B Sayed, AM El-Taher, HA Aboul-ella, SE Shaker(2001). Steinstrasse after extracorporeal shockwave lithotrispsy: aetiology, prevention and management. BJU International, 88,675-678.