



The management of the combined injuries of pelvis and lower urinary tracts treatment

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Tilyakov A. B., Valiev E. Y.,
Akhmedov R. N.

Republican Research Centre
of Emergency Medicine (RRCEM)
Tashkent, Uzbekistan

Address for correspondence/
Adres do korespondencji:
Farkhadskaya 2
100107 Tashkent
Uzbekistan
Republican Research Center of
Emergency Medicine
Traumatology Department
+99897 1110311 (mob.)
+99871 1504619 (office)
+99871 1504501 (fax)
akbar-tilak@mail.ru

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Summary

Introduction. The analysis of the cure of 638 patients with pelvic injuries has been done. Combined injuries of urinary bladder and pelvis were diagnosed in 58 (9,1%) patients. Medical assistance for those patients was done according to the worked-out standards of our hospital.

Material and methods. 20 (34%) patients were performed laparotomy with inspection of abdominal cavity organs and closing of urinary bladder's rupture with extraperitonization and epycystomy. In other 38 (66%) cases the patients were done extra-peritoneal closure of urinary bladder's wall with epycystomy. 32 (55,2%) patients with combined injuries of urinary bladder and pelvis were performed the operative interventions – osteosynthesis of pelvic bones. 24 (20%) patients had also the fractures of extremity bones and they were done 29 operative interventions.

Results. At the non-stable injuries of pelvic ring we have worked-out and applied into clinical practice the small-invasive method of stabilizing operations on the base of device of external fixation.

Conclusions. This method was applied in 190 (29,8%) patients. The worked-out treatment tactics of patients with pelvic bones fractures at the isolated and combined type allowed to get the positive out-come in 91,9% of cases at the decreasing mortality till 5,6%.

Key words: associated trauma, pelvic bones injures, urinal ways injures, wire-rods apparatus, external device, Multispiral CT, urography, urinal bladder graphy

STATISTIC STATYSTYKA

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Tables Tabele	0
Figures Ryciny	5
References Piśmiennictwo	15

BACKGROUND

Combined injuries of pelvis and lower urinary tracts are one of the hardest traumas and they more often than others lead to the lethal out-comes, long-termed disability and invalidity. In the structure of the combined injuries these traumas consist from 28,7 to 55%. Combined injuries of pelvis and lower urinary tracts consist from 4,4 to 12,8%. The most often reason of these injuries are the pedestrian accident and catatrauma. [1,3,6,15].

Inefficiency of standard approaches, insufficient efficiency of traditional complex of reanimatology and operative measures in the acute period of the disease, especially at the early admission period often leads to the lethal out-come. So, the mortality among the patients with the injuries of pelvis ring consists 16,8%, moreover at the isolated trauma – 2,8%, at the multiple trauma – 5% and at the combined injury – 41,3% [2,7,8,9,14].

The diagnostics of the pelvic fracture does not meet special difficulties and is carried by physical and radiological examinations of the patients. But the diagnostics of the injuries of lower urinary tracts especially with the combination of which with the traumas of abdominal cavity, at the late admission and at the development of the complications are followed with noticeable difficulties.

According to the literary data at the urinary bladder trauma combining with pelvic bones damages and abdominal ones, the diagnostic and tactic mistakes are observed in 25,6-33% of cases and post-operative mortality consists 18,9-36% [3,10,11,12].

Among the injuries of lower urinary tracts at the combined injury the integral part of them are belong to urethra's damages. In the peaceful practice 90% of urethra's damages are the consequence of the blunt injury. In men the to urethra's damages can be situated in any of its part and can have the different natures – from the rupture of mucous membrane to the total detachment from the bladder. [13,14]. The injuries of the mobile part of the urethra are often the results of the direct mechanic action. The traumas of the fixed part of urethra, as a rule can occur at the pelvic bones fractures and especially at the violation of the integrity of the front part of the pelvic ring. Accurate and quick clarification of the presence, type and localization of urethra's trauma is necessary for defining the treatment tactics, but the early diagnostics of the injuries of urinary tract often is the difficult task [8,11,12]. Blood discharge from urethra (urethroragia), urinary retention, hematomas of perineum indicate the urethra injury and the diagnostic value of these features is estimated in the literature in different ways. The considerable part of the patients with urinary bladder injuries are cured in surgical clinics and it needs attention to this issue not only from urologists but also the surgeons and traumatologists.

The issues of tactics and treatment methods choice at the combined injuries of pelvis and lower urinary tracts, the volume and the sequence of performing operative interventions, their durations still remain the topic for discussions.

MATERIALS AND METHODS

This research work is based on the analysis of treatment of 638 patients with pelvis injuries being cured at RRCEM from 2001 to 2007 and it consisted 8,6% from all patients being admitted with different traumas.

The isolated pelvic fractures were in 307 (47%) patients, 128 (20,1%) of them had the multiple fractures. In 338 (53,0%) patients the fractures were combined with another organs' and systems' traumas. The origin of pelvic traumas in 456 (71,4%) cases was an accident and 140 (22%) patients had catatraumas. 192 (30,1%) patients had alcoholic intoxication. Pelvic bones trauma complicated by the lower urinary tracts injuries was observed in 102 patients and it consisted 15,9% from all pelvic injuries and 30,1% in the group with the combined injuries. The traumas of the urinary bladder were diagnosed in 65 (63,7%) patients, the closed injury of urethra was revealed in 37 (36,3%) cases. It should be mentioned that in 7 (6,9%) patients the injuries of lower urinary tracts were combined with the traumas of abdominal cavity organs. There were 78 men, 24 women among them and people of young and capable age from 18 to 45 consisted 81 patients.

All patients with pelvic bones injuries the investigations volume and the cure were done by the standard scheme taking into account the dominating pathology. At the admission all the patients with the combined injuries of pelvis were placed into the shock room where they were examined by a traumatologist, a neurosurgeon, a reanimatologist, a surgeon, an urologist and other specialists. At the non-stable hemodynamics the patients were performed anti-shock manipulations. Simultaneously they were carried out surveys including general blood analysis, urina, blood for rhesus and group, blood for biochemical analysis and for coagulogramma, were done the X-ray investigations, USC of viscus, encephaloscopia, computer tomography and multi-scanned computer tomography if it was the necessity for them.

The difficulty of the diagnostics at the combined injury was due to the variety, cleared condition of the clinic process of abdominal cavity and retroperitoneal area traumas. The whole complex specific investigations was applied for the diagnostics and correct treatment. The most informative are the clinic blood and urina analysis among the applied laboratory investigation methods. They use USD of urinary bladder for the visualization of the indirect features. Patients with pelvic bones injuries were done the urinary bladder's catheterization, at the revealing blood in urina or the absence of urina they were done Zeldovich's test. All patients with urinary bladder's injury had the positive Zeldovich's test. These patients were performed the X-ray investigation (urethrography with the rising cystography in two views).

RESULTS AND DISCUSSIONS

According to our clinical observations the early period of the pathological process in patients with the combined injuries of pelvis and lower urinary tracts was divided into 3 periods:

- Shock – the first hours after the injury and it lasts till 12 hours (till the full or the partial hemodynamics's stability);
- From 24 to 72 hours (the interval till the appearance of peritoneal effects
- The 3rd period is the time of peritonitis advancing

In 53 (51,8%) patients admitted in early period it was revealed shock of the 1st and the 2nd levels and in 49 (18,2%) cases – the shock of the 3rd level.

At the examining 48 (47,1%) patients had peritonitis features and it was the indication for performing diagnostic laparoscopy, on results of which there were the combined injuries of pelvis and lower urinary tracts in 7 patients. 4 of them had spleen damage with internal hemorrhage features, 3 of them had small intestinal mesentery's trauma. They were done the splenectomy, wound closure of small intestinal with the further closure of urinary bladder's defect and epycystotomy. In 7 patients due to the hard condition at the admission and cleared clinical symptoms after 12 hours extraperitoneal injuries of the urinary bladder were revealed. In 41 (40,2%) patients intraperitoneal bladder perforation was revealed. According to clinical-instrumental data, in 17 (16,7%) patients extraperitoneal bladder perforation was revealed. All patients with urinary bladder injuries were performed the emergency operative interventions by the closure of urinary bladder with epycystotomy and the

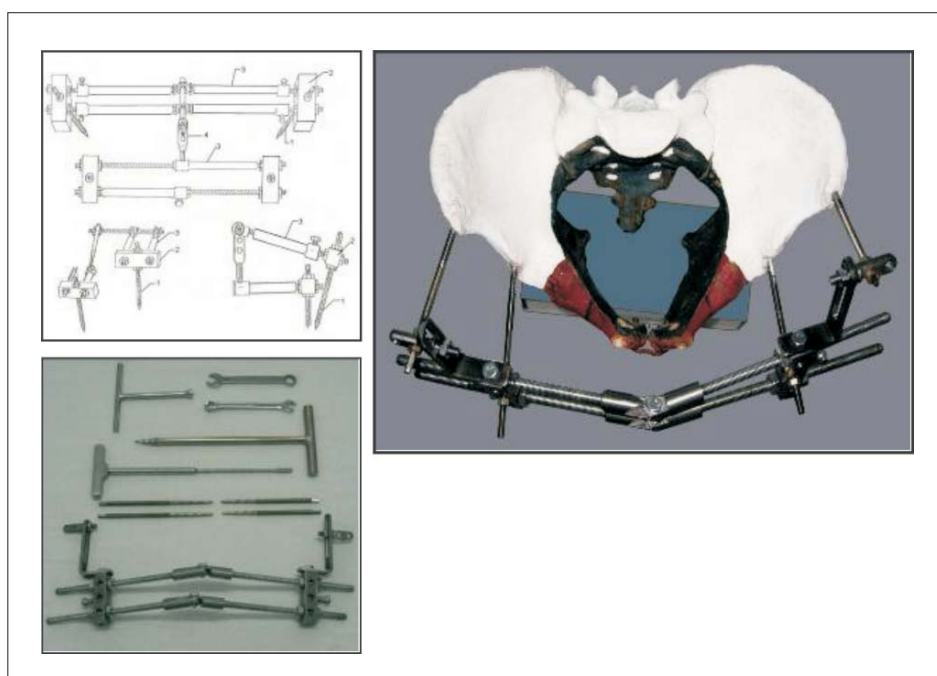
lethal out-come was in 4 cases the reason of which were the complications of the acute period of the traumatic disease.

From the total amount of patients in 37 (36,35) cases it was revealed the urethra's trauma. In 29 of them there was urethroragia and in 8 patients had the features of the acute urinary retention. In all cases they were done urethrography using Threeambrast 76%-20.0 contrast substance. The main tactics of intervention was the prescription of getting trauma, the presence of non-stable hemodynamics and the extravasation of the contrast substance at the urethrography.

From 37 patients 14 of them admitted within 6 hours after getting the trauma. Due to X-ray investigations the extravasation of the contrast substance in the back part of urethra. These patients were performed the primary suturing, urethra-urethra anastomosis end to end with urinary bladder drainage. In 25 cases it was the late admission more than 10 hours after getting trauma and the patients had the infiltration of paraurethral tissue and perineum. Considering the existing complications all these patients were done epicystomy, autopsy, sanation and drainage of urinous infiltration of perineum. In 12 patients with urethra injuries being operated with the primary suturing, urethra-urethra anastomosis end to end there were positive results and they were discharged home in satisfactory condition with self-maintained urination. Other 25 patients after performing the emergency assistance were sent to the specialized clinics for the further cure.

58 patients with urinary bladder injury and pelvic bones fractures in post-operative period (after 12-14 days) the cystotomic drainages were moved-off due to the

Pict. 1. Device for reposition and fixing pelvic bones fractures



recovery of self-maintained urination. 19 old aged patients with the presence of infra-vesical obstruction were discharged with the cystotomic drainages. Later after the final recovery the drainages moved-off.

Our approach to the treatment of bone fractures of the pelvic ring was based on the estimation of the dominating injury taking into account the indications, all methods of repositions, stabilization and fixing the damages were used.

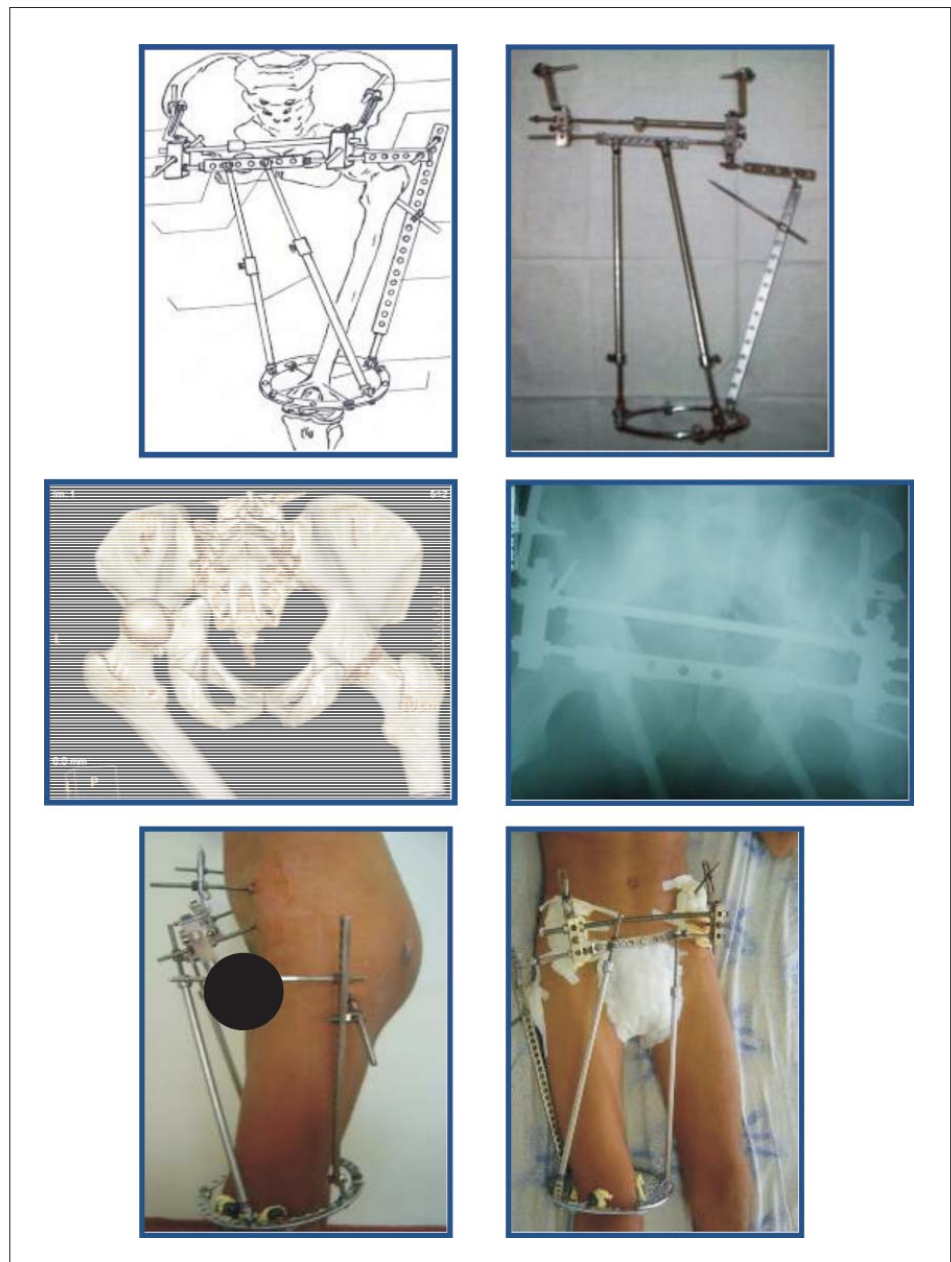
For improving the results of treating patients with non-stable injuries of the pelvic ring we have worked-out and applied in the clinical practice the mini-invasive method of stabilizing operations on the base of the external fixation apparatus (pic.1,2). The indication to the surgical treatment with using these apparatus are all non-

stable pelvic injuries. The operation is performed on 3 levels: preliminary reposition with the moving-off the rough removals, implanting rods or bun of short wires, assemblage of carcass and fixing the rods to the carcass with permanent correction of the removals.

The advantages of applying the stabilizing operations are:

- Little traumatism of the method, the possibility of using it in first hours after getting trauma;
- Creating conditions for reposition and stable fixing of pelvic bones pieces with the correction ability at treating levels;
- Stabilization of pelvic injuries promoted hemostasia, lessening of pain syndrome and it was one of anti-shock manipulations;

Pict. 2. The spoke-bar device for treating transacetabular pelvic fractures



- Supplying comfort at the patients care with the ability of early rehabilitation;
- Decreasing the risk of hypostatic and the other complications

All these innovations were patented at the Patent Bureau of Uzbekistan. We have applied the bar apparatus for treating the pelvic injuries for 190 (29,8%) patients. The fixing duration was varied from 4 to 12 weeks.

The treating results of pelvic injuries for 5 years have been studied in 517 (81%) patients and were estimated on 3 points system. The good results (the jointing without removal or with small removal, the absence of dystrophic changes) were in 286 (55,5%) patients. Satisfactory results (the jointing with noticeable removal, pain in quiescent state, blurred step violation, minor restriction of motions in hip joint) were observed in 188 (36,4%). Unsatisfactory results (paraosseous ossifications, the full distruction of symphysis, iliosocral joint or hip joint, high intensity pain, shortening of limb, noticeable step violation) were in 42 (8,15) patients. The causes of bad results were insufficient repositions in 31 patients, late admission (3-6 weeks after) in 11 patients.

The cure results in the group of patients with combined injuries of pelvis and urinary bladder were studied in 54 (93,1%). 26 (47,7%) people had good, 16 (30,4%) patients had satisfactory and 12 (22,4%) people had unsatisfactory anatomic-functional results. The lethal out-come was in 36 (5,6%) cases. The causes of mortality were the hard injury, hard condition at the admission and the developed complications during the treatment.

There is a clinical example given below.

The patient J., 27 years old. Case history No 9468/776. She was injured in the accident.

Diagnosis: The combined injury. Closed craniocerebral injury. Cerebral contusion. Closed fractures of pubic and ischial bones from the right with the removal of bones pieces, the rupture of iliosacral joint and sacrum fracture from the right. Closed abdominal injury. Intraperitoneal rupture of the urinary bladder (Pict.3).Urinary peritonitis. Multiple abrasions of face, body and extremities. traumatic shock 2nd degree. TS.- 9 points.

The patient was operated in 1 hour after the admission. Operation was done consistently by two surgical



Pict. 3. The plain film of pelvic bones with contrast cystography



Pict. 5. 1 month after the operation



Pict. 4. The view of the device 3 days after the operation

teams, laparotomy, closing of intraperitoneal rupture of the urinary bladder, epicystostomy, sanation and drainage of abdominal cavity. The closed front-side stabilization of pelvic bones by the spoke-bar device. The duration of the operation was 1 hour. The post-operative period was positive, the wounds repaired by primary intention (Pict.4). In 8 days she was discharged home for outpatient treatment. In 15 days the patient could move. (Pict.5). The device was dismantled from the pelvis in 2 months. She had the recovering therapy. In a year the patient's condition was satisfactory, without any complaints and she began to work as a waitress.

The treatment tactics of the patients with pelvic bones fractures allowed to get the positive out-come in 91,9% of cases at the decreasing of mortality till 5,6%. The devices offered for the cure of pelvic bones fractures have made important corrections in the complex of anti-shock

actions and the prophylaxis of the complications, simplicity and availability of the method allows to widely use it in every day practice.

CONCLUSIONS

- At the pelvic fractures it is necessary to include the methods of revealing the urinary tracts injuries (Zelidovich's test) into the diagnostics protocol.
- The modern methods of X-ray diagnostics should be included into the complex investigations: rising cystography in 2 projections; urethrography combining with computer tomography.
- Applying laparoscopy allows to minimize diagnostic mistakes at the combined pelvic injury.
- Hard non-stable pelvic bones injuries must be stabilized in first day of getting trauma with the use of less-traumatic methods.

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