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VESICO-RECTAL FISTULA AND ITS SIMILAR CASES IN SPINAL CORD INJURY

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In 1949 Prof. IWAHARA reported on various aspects of the sequelae to spinal cord injury. He stressed that the infection of the urinary tract and its late complications were the most important sequelae which presented very intricate symptoms.

Since the therapeutic treatments of these conditions have not yet been established, they often become the main causes aggravating the general condition of spinal cord injury.

The vesico-rectal fistula and its related conditions are some of these late complications.

At the National Hakone Sanatorium, we have encountered eleven such cases. Subjective symptoms were usually lacking despite the severity of their physical condition and local changes were obscure until a quantity of urine unexpectedly leaked from the anus. In some cases, pericystic abscess spread to the suprapubic region and a large amount of pus and urine was evacuated by incision.

A review of the literature failed to disclose any such case report, except one by KANAI in our Sanatorium who has described it briefly in his statistical report.

It is worth while to demonstrate some of these illustrative cases in detail and also to discuss the mechanism, diagnosis and treatment of this troublesome complications.

CASE REPORTS

Nine cases of vesico-rectal fistula and two cases of the related conditions are shown in Table 1. Of these, cases I, II and XI will be described in detail.

Case I.

This patient had paraplegia below the third lumbar segment. Urination was incontinent. He was also in a habit of obstinate constipation and coprostasis was noticed in the left hypogastrium, so he made it a rule to insert his finger into the rectum to scrape fecal mass out every 4-5 days. Two years and four months after the injury, an elevation of temperature with chill persisted and the general condition was aggravated though objective findings were negative. Several days later, diarrhea with oliguria occurred suddenly. After instillating methylene blue solution into the

Table 1. Vesico-rectal fistula (9 cases) and its similar cases (2 cases)

	Sex Age	Spinal cord injury		Urinary fistula.		Course
		Level, Stage	Defecation Miction	Time (after injury)	leak of urine.	
I	M 30	L I Complete	Obstipation incontinence	2yrs. 4 mos.	Rectum	11 days after onset died for complication
II	M 40	L II "	" "	1yr.	"	4mos after onset died for complication
III	M 33	S I "	" "	1 yr.	"	retain-urethral catheter. recover
IV	M 48	B X "	" "	9 yrs. 2 mos.	"	"
V	M 39	B XI "	" "	9 yrs. 5 mos.	"	"
VI	M 24	B XII "	" "	2 yrs. 8 mos.	"	"
VII	M 31	B IX "	" "	8 mos.	"	"
VIII	M 28	B XII "	" "	6 yrs.	"	"
IX	M 24	L I "	" "	1 yr. 10 mos.	"	"
X	M 39	B XII "	" "	12 yrs. 11 mos.	incision wound	incision(hypogastric wall) retain-urethral catheter.
XI	M 49	B X "	" "	2 yrs. 6 mos.	incision wound	incision, recidive, 2 yrs. 4mos. after onset dead.

bladder with urethral catheter, the solution leaked into the rectum and it was confirmed for the first time, the patient had a vesico-rectal fistula.

X-ray findings: Cystography in an oblique position using "Sugiuron" revealed trabeculation of the bladder and dilation of the vesical neck and, still more, a fistular shadow running between the posterior urethra and the rectum. (Fig. 1)

By digital rectal examination, neither swelling nor induration of the prostate noticeable and owing to anesthesia neither pain nor tenderness were sure. A fistulous opening was observed on the front wall of the rectum about 5 cm above the anus and by pressing hand on the abdominal wall and asking the patient to increase abdominal pressure, a

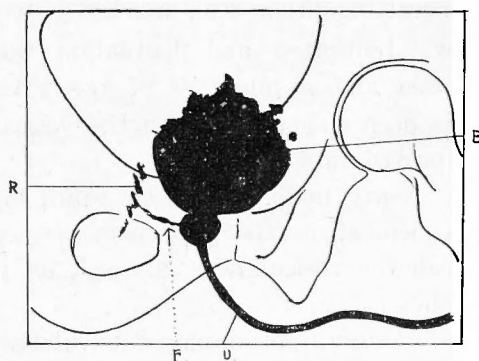


Fig. 1 Case I Cystogram. (Oblique position)
B-Bladder. U-Urethra. F-Fistel. R-Rectum.

quantity of fetid pus and urine were discharged from the fistulous opening of the rectal wall.

As soon as the retention catheter was used, leakage of urine ceased, but due to an aggravation of decubitus and pneumonia, the patient expired eleven days later.

Dissection findings: Severe inflammation of the urinary tract and bilateral pyonephrosis were observed. Prostatic abscess had ruptured and spread to the vesical neck and around the rectum, penetrating the rectum on the front wall. Multiple abscesses in bilateral lung with bilateral pyothorax were also noticed.

Case II

This patient continued feverish for eleven months after injury and noticed tenderness and induration in the suprapubic region a little to the right of the median line. One month later, the quantity of urine decreased suddenly, and diarrhea mixed with bloody pus began, and at the same time his temperature subsided and general condition improved. It was attempted to confirm the existence of the urinary fistula by injecting "aktisol" into a vein and looking for the dye in the rectum, but this was unsuccessful.

After insertion of a retention urethral catheter, diarrhea ceased and urinary output increased to normal.

Two months later, he became feverish again and had a leakage of urine from the anus, with added complications of purulent orchitis, bilateral pneumonia, pyothorax, etc. His general condition declined rapidly and the patient expired.

Dissection findings: Prostatic abscess which had communicated with the urethra, involved the perivesical region and ruptured into the front wall of the rectum. Two small calculi were found in this abscess. Besides, there were multiple abscesses in bilateral lung, pyothorax and severe pyonephrosis.

Case XI

This patient had sustained serious injury of spinal cord and was bed ridden. Urine was incontinent and persistent diarrhea followed by obstinate constipation was repeated.

Two years and a half after the injury, he began to suffer from continuous chill and fever, together with poor appetite, vomiting, hematuria, etc. and his general condition was markedly weakened. Objective findings were comparatively few. Induration and fluctuation was observed in the suprapubic region. It was incised and a quantity of pus with coli bacillus smell was evacuated. The abscess was deep enough to reach the vesical neck. After the incision, his general condition improved rapidly.

X-ray findings: Fistulogram taken by means of instilling "Sugiuron" into the wound in the suprapubic region, showed that the abscess was deep enough to reach the vesical neck as well as prostatic urethra and surrounded the urethral catheter.

Cystography disclosed a dilated vesical neck and an irregular abscess around the prostatic urethra.

By retaining an urethral catheter, leakage of urine from the wound of incision

stopped and the wound healed after several months. Recurrence was repeated several times and the cicatricial part ruptured with hematuria and leakage of pus and urine was repeated. In another three years, the former condition appeared once more and a large abscess formed around the bladder, the patient complained of colic fits in the epigastrium and aggravated decubitus and after one month expired.

Dissection finding: Prostatic abscess ruptured and the pus spread to almost all the bladder and communicated with the wound in the suprapubic region.

On the other hand, no sinus tract was found in bilateral ureter and on the vesical wall. An irregular fistulous opening was recognized at the front wall of the prostatic urethra. Bilateral pyonephrosis and subphrenic abscess was observed.

II DEVELOPMENT OF URINARY FISTULA

As observed from the above three dissection cases, abscess at first formed in the prostate and then ruptured into the urethra as well into the periprostatic spaces, developing to the perivesical abscess. In severe cases, abscess reached all around the bladder and oppressed it. Rupture into the urethra did not occur on the median line but on either side of the verumontanum and an irregular fistulous opening of 0.3~0.5 cm in diameter formed.

In cases I and II, the prostate adhered to the front wall of the rectum at about 4~5 cm above the anal sphincter. The rectal mucosa at that site presented edematous swelling and a round induration of thumb-size. A dimple was found at this indurated site and there was a fistulous opening at the central part of this dimple.

In case XI, abscess communicated with the incised wound in the right suprapubic region. No fistulous opening was discovered either in bilateral ureter or on the vesical wall. Infection of the urinary tract was severe and pyonephrosis was observed. Multiple abscesses in bilateral lung, which was considered to be metastatic foci of the prostatic abscess, and pyothorax, subphrenic abscess, etc. were also found.

The above facts show that the prostatic abscess forms at first and ruptures into the urethra, and at the same time, as in cases I and II, communicates with the rectum, or as in case XI, opens to the abdominal wall. So it is not a real "vesico-rectal fistula" but a "vesico-prostate-rectal fistula".

Furthermore, it may develop into purulent phlebitis and septicemia and form metastatic foci, and result in death. (Fig. 2)

The pathological process of formation of the urinary fistula may be explained as follows. In severe spinal cord injury, infection of the urinary tract and disturbance of micturition is inevitable and obstinate constipation usually follows. Trauma to the urethral mucosa due to catheterisation, stagnation of the hard fecal mass in the rectum and attempt to extirpate the fecal mass, will be repeated for a long term. Such mechanical stimulation gives rise to a suitable condition for the occurrence of prostatitis.

During the worst and chronic stage of the inflammation of the urinary tract, infection spreads to the prostatic gland mainly by the contaminated urine and progresses to the prostatic abscess. Finally these abscesses rupture into the urethra

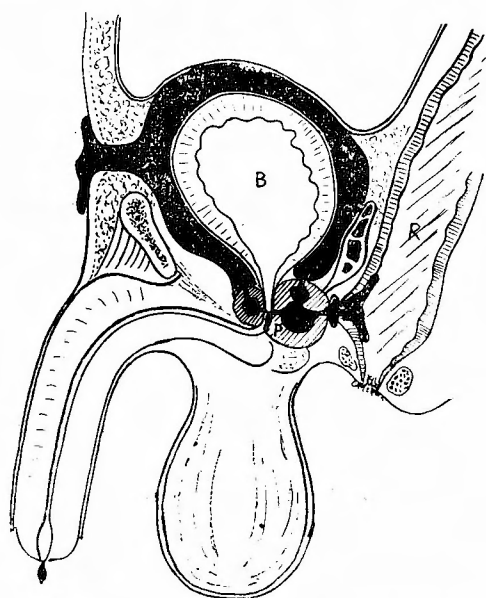


Fig. 2 B-BLADDER P-PROSTATE
R-RECTUM ●-ABSCESS

and rectum, forming a vesico-rectal fistula.

However, as the prostate is situated topographically at the crucial site among the organs of defecation and uro-genital function, and is physiologically one of the most important organs for genital function, various influences to this gland, even its degeneration, may be anticipated in spinal cord injury in which all of these functions are disturbed seriously.

Therefore it is not to be concluded that prostatitis in spinal cord injury is so simple as it has generally been accepted.

III DIAGNOSIS

As shown in these three fatal cases, it is not uncommon that the prostatic abscess, in spinal cord injury develops rapidly into phlegmone, perivesical abscess, purulent phlebitis and septicemia, forming metastatic foci

and results in death. It is necessary to discover it in its early stage in order to prevent aggravation of the general condition. But in early diagnosis of prostatic abscess in spinal cord injury, many difficulties are confronted. Disturbance of defecation and micturition is severe and in almost all cases, infection of urinary tract with persistent pyuria is found, also fever, hematuria and incontinent diarrhea are very common.

Moreover, patients lacking local pains, and other subjective symptoms being unsure, it is not always easy to locate where the main cause of aggravation of general symptoms lies in urinary tract. In early stages even by inspection of the rectal mucosa and by anal digital examination, swelling, induration and tenderness of the prostate and rectal wall are not ascertained. At the stage of formation of abscess, fluctuation and induration of the prostate becomes hardly palpable.

When the abscess spreads to all around the bladder, fluctuation can sometimes be felt by the inserted finger into the anus and one finger on the abdominal wall. But usually it is not easy to diagnose vesico-rectal fistula until discharge of pus and leakage of urine into the rectum herald its existence.

Even in this stage, it is difficult to discover a fistulous opening because of swelling, redness and edema of the rectal mucosa, but it can be located 4-5 cm above the anus a little lateral of the mid-line, if carefully examined. In this part a thumb-sized round induration is observed and at the central part of its depressed surface, there is a fistular opening. It has adhered with the prostate and it has become immovable.

The first leakage of urine from the rectum is liable to be misdiagnosed as incontinent diarrhea caused by disorder of the intestine or by some other reasons

in spinal cord injury; and cases III, IV and V are the examples in which vesico-rectal fistulae were passed unnoticed for as long as several months or years until they were found at last by harvouring suspicion because of the frequent recurrence of incontinence of diarrhea-like feces. Soft feces in the case of vesico-rectal fistula, though it looks like diarrhoeic feces, can roughly be differentiated by the fact that hard fecal mass is palpable in the hypogastrium even when diarrhea continues, that the feces are a mixture of both urine and a hard fecal mass, that with the starting of diarrhea, the output of urine decreases markedly, while by retaining a urethral catheter, it soon increases and diarrhea stops simultaneously, but despite continuous diarrhea, dehydration of the whole body is almost negligible.

As a steady means of diagnosis, dyes can sometimes be used. But these cases having impairment of renal function, excretion of dyes is extremely delayed, and urine is usually opaque and occasionally hemorrhagic.

Therefore, the excretory study with dyes such as "aktisol", indigocarmin, and others is liable to end in failure. The fistula can be accurately diagnosed if the dye is observed leaking in the rectum after instilling it intravesically by way of the urethra.

In the bladder of spinal cord injury, "Schramm's phenomena" being frequently positive and excretion of urine being impaired, differential diagnosis between vesico-rectal fistula and vesico-prostate-rectal fistula can not be established by the observation of the leakage of urine alone.

Cystoscopy is rather prohibital especially in the worst stage of prostatic abscess, because in spinal cord injury, the bladder decreases in its capacity and cystoscopy is often difficult due to pyuria, also the inflammatory process of the urinary tract may sometimes be aggravated by the use of the cystoscope.

In cases III, IV and V which were examined during their stabilized stage, inflammatory hyperemia and trabeculation of the vesical mucosa was observed but no fistulous opening was detected in the vesical mucosa.

In cases III and VI, in which "Schramm's phenomena" were positive, an unclosed irregular fistulous opening was recognized on one side of the verumontanum of the prostatic urethra.

With the panendoscope, fistulous opening can be discovered more easily and in case IV, one which could not be found with the usual examining cystoscope, was detected with the panendoscope.

Cystogram is also valuable to demonstrate the fistula. After instilling the opaque medium such as "Sugiuron" or a solution of sodium jodide into the bladder, films should be taken in each of an oblique, ventral and side position.

If each of these roentgenogram is made stereoscopically, thus observation become much easier. But generally speaking, as the fistula is narrow and small, and as the last part of the opaque medium in fistulous tract is insufficient after it has escaped into the rectum, the fistula can not always be demonstrated in every roentgenograms in spite of earnest efforts.

Case I and case III (Fig. 3) are the examples in which fistulography were

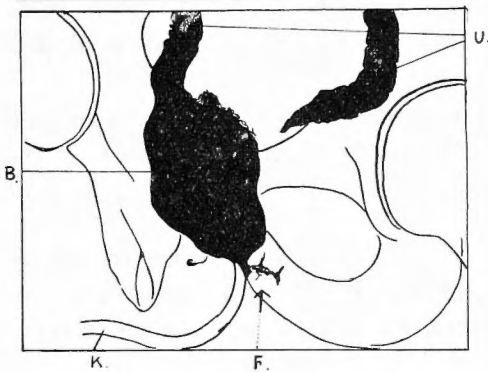


Fig. 3 Case VII Cystogram (Oblique position)
U-Ureter, B-Bladder, F-Fistel, K-Urethra
catheter

In cases X and XI, in which abscess formed in front of the bladder, pus was evacuated by incision and abscess was ascertained reaching the posterior urethra by infusing an opaque medium such as "Sugiuron" or "Moljodol" from the wound of incision; and in case XI, a shadow of the prostatic abscess was clearly visible in a cystourethrogram.

TREATMENT

It has been attempted to discover prostatitis in its early stage and to treat it by administration of effective antibiotics and chemotherapeutic compounds and by local cold pack, but the effects are not always certain. In the management of the bowel, especially in the procedure to extirpate the fecal mass, great care must be taken. When prostatic abscess has formed, it is required to drain pus by an incision either from inside of the rectum or in the perineum or in the suprapubic region, in order to decrease tension in the abscess to prevent progression of the inflammatory process.

In order to prevent the aggravation of a general symptom, a strong nutriment should be given either per os or per cutan, and marasm must be prevented by blood transfusion.

When recto-vesical fistula has formed and a discharge of pus and a leakage of urine have been found, urinary infiltration caused by the elevated inner pressure of the bladder can be avoided for the time being by retaining urethral catheter. At

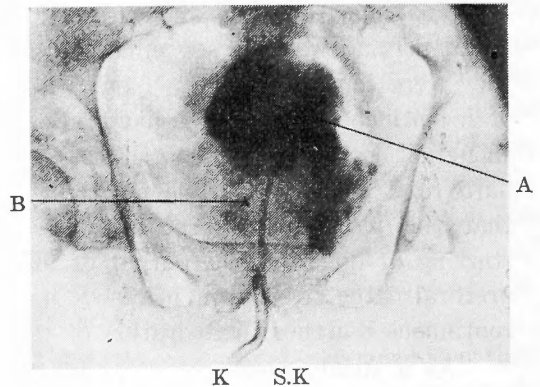


Fig. 4 Case VII A-Abscess, B-Bladder
K-Urethra catheter, SK-Small catheter

successful in an oblique position; and case IV is a successful example in a side position. Fistula is shown in these cystograms as a linear shadow running from the prostatic urethra to the rectum. In case VII (Fig. 4), after inserting of small catheter into the abscess from the fistulous opening in the rectal wall to evacuate pus and then instilling an opaque medium, a roentgenogram of pericystic abscess was made.

the same time, drainage of pus into the rectum should be attempted.

By means of a retention urethral catheter, leakage of urine may be stopped quickly. But complete healing of fistulous opening is difficult and when a catheter is pulled out, urine and pus begin to leak out once again sooner or later.

Radical surgery might be suggested as a treatment of choice.

However, in serious spinal cord injury, as many difficulties and risks are anticipated, indication of operation should be determined prudently.

CONCLUSION

As one of the late complication of the urinary tract in spinal cord injury, there is a recto-vesical fistula and its related conditions.

We have experienced eleven cases and synthesize them as follows:

1. Vesico-rectal fistula and related conditions are raised by spontaneous rupture of prostatic abscess to the front or rear side of this gland.

2. As prostatic abscess in spinal cord injury spreads in many instances to pericystic space and develops to vesico-rectal fistula without presenting any special symptoms and then results in death, we should be suspicious about the existence of prostatic abscess and should not be idle in rectal digital examination, when patients have the general symptoms of spinal cord injury aggravated.

3. In X-ray examination of vesico-rectal fistula, urethrocystogram taken in an oblique position and stereo-cystogram are valuable, though they are not always successful.

4. To discover prostatic abscess in its early stage and to make surgical drainage of pus, is desirable.

Retention of urethral catheter is a effective mean of stopping leakage of urine from recto-vesical fistula.

Indication of radical surgery of urinary fistula should be determined most prudently.

邦文抄録

脊髄損傷に於ける膀胱直腸瘻並類似症

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脊髄損傷に於ける尿路合併症の一つに膀胱直腸瘻並びに類似症がある。これは前立腺膿瘍を起点として、前方と後方への自潰によつて生じたものである。前立腺膿瘍は特異な症状を呈することなく、膀胱周囲膿瘍、敗血症へと発展して死の転帰をとることが少なくないので、重度脊髄損傷の全身症状の悪化には一応、前立腺膿瘍を疑い直腸内診をおこたつてはならない。故

に早期に発見して、切開、排膿が必要である。全身状態に留意し、尿漏には尿道カテーテル留置を行う、膀胱直腸瘻の根治的手術の適応は慎重に決すべきである。

(この要旨はさきに第9回厚生省医務局研究発表会において報告した。)