



Perinephritic Abscess

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INDEX

	<u>PAGE</u>
I. ABSTRACT	
PERINEPHRITIC ABSCESS	177 - 179
II. CASE REPORT	179 - 180
III. CASE REPORT	180 - 181
IV. LAST WEEK	181
V. WHALING	182
VI. VISITORS	182
VII. INTERDEPARTMENTAL SEMINAR FOR MEDICAL RESEARCH .	182 - 183
VIII. ALPHA OMEGA ALPHA LECTURE	183
IX. SPECIAL LECTURE FOR MEDICAL STUDENTS AND OTHERS .	183
X. GOSSIP	183

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I. ABSTRACTPERINEPHRITIC ABSCESS

John R. Paine

Historical

While Hippocrates recognized that pus at times collected around the kidney and advised that such abscesses be incised, it was not until 1839 that Rayer described suppurative inflammation of the perirenal fatty envelope as a clinical entity, coined the term "perinephritis" and proposed a classification of the infections. Trousseau emphasized trauma in the production of such abscesses. In 1880, Goddy and later Reverdin described the treatment of perinephritic abscesses by aspiration. In 1889, Albarrau succeeded in producing abscesses in the perirenal tissue by the injection of staphylococci into the circulation.

In 1896 and 1905, papers by Lilienthal and Israel, respectively, suggested the etiological importance of cortical abscesses of the kidney and skin infections.

Campbell in 1912 first pointed out the direct and indirect x-ray signs. Laurell, Revesz, Beer, Lipsett, Ockerblad, Schmidt and Rigler have also described these findings.

Classification

Rayer first classified perinephritic abscess into:

1. Those occurring secondary to some lesion in the kidney.
2. Those occurring without any lesion in the kidneys.

While no classification has been universally accepted, the following seems to fit fairly closely the opinions expressed by the papers reviewed.

1. Primary abscesses - cases where no other foci of infection can be found. (Some authors deny the existence of such cases.)

2. Metastatic abscesses - cases where the infection is brought to the perirenal tissue by either the lymphatics or the blood stream.
3. Secondary abscesses - cases where the infection is due to a pre-existing infection in the kidney. (Some authors feel that practically all perinephritic abscesses belong in this group.)

Incidence

The general incidence of perinephritic abscess is low. Up to 1914, there had been only 67 cases so diagnosed at the Mayo Clinic, although Hunt, in 1924, could report 106 cases treated between 1914 and 1924 at the same clinic.

60 to 70% of cases occur between the ages of 20 and 40. The condition is found approximately twice as often in men as in women. The right side is more often involved than the left. A bilateral involvement is extremely rare.

Etiology

The primary causative agent is usually the staphylococcus, either staphylococcus aureus or staphylococcus albus. Other types of bacteria may occasionally be found and mixed infections are not infrequent. The following bacteria have been reported as occurring in perinephritic abscess:

1. Staphylococcus
2. Streptococcus
3. Gonococcus
4. Tubercle bacillus
5. Bacillus coli
6. Typhoid bacillus
7. Actinomycosis

There is a great variation among various authors as to the proportion of cases which are secondary to kidney infections and those which are secondary to peripheral infection. All agree that true primary perinephritic abscess is rare. Probably 40 to 50% of cases occur secondary to a kidney lesion: usually a cortical abscess, pyonephrosis, tuberculosis or kidney stone. 50 to 60%

occur secondary to a peripheral infection: usually a boil, carbuncle, infected tooth or pelvic infection.

Symptoms

Pain in the lumbar region, malaise, loss of weight, chills and fever are the symptoms of which these patients most commonly complain. No one symptom is present in every case; pain, the most common symptom, occurs in 80 to 90% of all cases. Pain is the symptom for which the patient seeks relief though it may be of a varied nature and frequently is referred to the lower abdomen, genitals, hip or knee.

Urinary symptoms are rare, probably present in 10 to 15% of patients and when present the perinephritic abscess is usually secondary to a renal lesion. Frequency, urgency, dysuria and nocturia may be present.

Physical findings

The physical findings in an early case may be few and difficult to elicit but in a well developed case tenderness in the costovertebral angle and lumbar region is nearly always present. A fullness or mass may be felt. Fever is remittent in type and may reach 105°F. The thigh is often held flexed at the hip due to psoas spasm. A lumbar scoliosis can be occasionally detected. The leucocyte count averages from 15,000 to 20,000. The urine examination is usually entirely negative except in those cases secondary to some kidney lesion when the urinary findings are characteristic of that condition. In metastatic perinephritic abscess, the urine may show a small amount of albumin and occasional leucocytes.

X-ray Findings

The x-ray findings have been well described by Rigler. He has divided these into two groups, i.e. direct and indirect. The direct signs, such as the shadows of calcium deposited in the abscess wall and the superposition of the shadow of the abscess on that of the kidney, are rarely seen and are of little clinical importance.

The indirect signs are as follows:

1. Obscure kidney outline and psoas muscle shadow.
2. Scoliosis with approximation of costal margin and ileum.
3. High position of the diaphragm and immobilization of the diaphragm.
4. Displacement and deformity of the colon.

These signs appear from 7 to 14 days after the beginning of the abscess and are of great value in making a diagnosis.

Diagnosis

The diagnosis of perinephritic abscess is notoriously difficult to make in its early stages. Higgins and Hicken even go so far as to state that the diagnosis cannot be made in 32% of the cases. This, however, appears to be unwarranted pessimism. The difficulty in diagnosis is amply proven when the time interval between the onset of symptoms and hospitalization is considered as follows:

Peacock	-	39 days
Habein	-	39 "
Eisenstaedt	-	25 "
Rigler and Manson	-	23 "
Fowler and Dorman	-	38 "

There is no mention in the papers studied of diagnostic aspiration with needle and syringe. This is routinely done at the University Hospital on all suspected cases and seems to us to be a most valuable procedure and one which should rarely be omitted.

Treatment

Simple incision and drainage suffices to produce a cure in the majority of cases. Those abscesses secondary to a renal lesion may require in addition a nephrectomy which can be done primarily or secondarily depending on the general condition of the patient. Abscesses secondary to a cortical abscess of the kidney and also the cortical

abscesses themselves frequently heal after simple incision and drainage.

Some authors recommend a complete urological work-up before instituting treatment and others insist that the kidney should be thoroughly explored with the finger at the time of incision. Such procedures would seem to be more strongly indicated in those cases presenting urinary symptoms and pus and albumin in the urine.

Following incision for drainage, a discharging sinus may persist for 6 to 12 weeks. If healing is not complete at the end of 3 months, one should suspect a kidney lesion which will probably not heal without more radical procedures.

Prognosis

The mortality in various series of perinephritic abscess is as follows:

Fowler & Droman	- 11 cases	- 27%
Hunt	- 106 "	- 7%
Rigler & Manson	- 19 "	- 5%
Braasch	- 67 "	- 3%
	(oper.mortality)	
Habein	- 44 cases	- 7%
	(all extrarenal in origin)	

Prognosis would appear to depend largely on early diagnosis and prompt treatment. The mortality in our series (Rigler and Manson) compares quite favorably with other series.

Summary

1. Perinephritic abscesses were first studied and described by Rayser in 1839. Campbell, in 1912, first pointed out the direct and indirect x-ray signs.

2. In general, three types of abscesses are recognized: primary, metastatic and secondary.

3. The general incidence is low.

4. Most cases appear in patients 20 to 40 years old.

5. The right side is more frequently involved than the left.

6. The most common bacterium in the pus is the staphylococcus.

7. Forty to 50 per cent of cases occur secondary to a lesion in the kidneys; 50 to 60 per cent occur secondary to some peripheral infection. True primary abscesses are rare.

8. Pain in the lumbar region, malaise, weight loss, chills, fever are the most common symptoms.

9. Urinary symptoms occur in only 10 to 15 per cent of cases.

10. Tenderness, the presence of a mass, high remittent fever, psoas spasm, elevated leucocyte count are the usual findings.

11. Indirect x-ray findings are often of great value in making a diagnosis but are not present for the first week or two.

12. The diagnosis is difficult to make.

13. Four to five weeks usually elapses between the onset of symptoms and the beginning of treatment.

14. Treatment consists usually in incision and drainage. In certain cases, nephrectomy may be indicated.

15. There is about a 7% mortality in the condition.

II. CASE REPORT

Male, age 19.

Admitted 7-10-35 and
discharged 7-19-35.

Present Complaints

Soreness in left side, loss of "pep," and weakness.

Past Illness

12- -34 - Noted gradual onset of lassitude and weakness. Dropped from high school basketball squad because of lack of endurance.

5- 3-35 - Gradual progression of symptoms until this time. Suddenly developed pain over left hip. Pain much worse on motion of left leg or back. Local physician consulted during this month.

6- -35 - Consulted another physician. Diagnosis of infection of left ilio-psoas muscle made. Treated with staphylococcus toxoid and supportive methods with no improvement.

Admitted

Physical examination: well developed, thin and quite pale. Left lumbar region spastic. Scoliosis of lower thoracic and lumbar spine with concavity to left. Costovertebral angle quite tender to palpation. Anterior abdominal wall spastic over left lower quadrant and a large tender mass palpated in this region. Temperature 101.4. Pulse 116.

Laboratory

Blood - hemoglobin 70%, white blood cells 19,650, polymorphonuclears 84%, lymphocytes 16%. Urine - negative.

Diagnostic procedures

1. X-ray of abdomen: obliteration of left ilio-psoas muscle and left kidney shadows; scoliosis of spine with concavity to left.

2. Aspiration of left lumbar region made and thick creamy pus obtained which on smear and culture showed staphylococci.

Diagnosis

Left perinephritic abscess.

Treatment

Incision and drainage of abscess through left lumbar region.

Subsequent Course

Transfusion of 500 cc. citrated blood given before patient's discharge (7-19-35) with wound still draining. Much improved.

O.P.D. (8-16-35)

Wound dressed. Healing progressing satisfactorily. Slight drainage still present. Subsequent appointments not kept.

III. CASE REPORT

Female, age 21
Admitted 8-5-34 and discharged 8-20-34.

Present Complaints

Sharp, steady pain in left lower portion of abdomen.

Past Illness

For 9 months, patient had experienced occasional attacks of pain in lower abdomen and lower back. Pain more marked on left. No urinary symptoms.

8-3-34 - Became acutely ill with pain, as described above and also with severe chill and anorexia. Some dysuria and frequency. Last menstrual period on 7-28-34 was normal.

Admitted

Physical examination: well developed female with flushed face, apparently in considerable pain. Abdomen - tender throughout, mostly so in lower quadrants. Spasticity together with rebound tenderness in both lower quadrants, most marked on left. Left flank and lumbar region quite tender to palpation. Pelvic examination - rather diffuse, moderate tenderness. Temperature 99.4. Pulse 94.

Laboratory

Blood - hemoglobin 70%, white blood cells 24,500, polymorphonuclears 94%, lymphocytes 6%. Urine - light cloud of albumin and an occasional white blood cell.

Diagnosis

Uncertain. Salpingitis or left pyelitis considered. Treated symptomatically and observed two days.

8-7-34 - X-ray of abdomen - obliteration of left iliopsoas muscle with left renal calculi.

8-8-34 - Much improved. Symptoms and findings now well localized in left costo-vertebral angle. Diagnosis of left perinephritic abscess and left nephrolithiasis made.

8-9-34 - Aspiration in left lumbar region recovered thin, foul-smelling pus. Smear showed presence of staphylococcus and streptococcus. Abscess incised and drained.

8-20-34 - Discharged to care of local physician.

10-10-34 - Cystoscopic examination and left pyelogram - multiple left renal stones with pyelonephritis and reduced kidney function.

Readmitted

10-15-34 - Readmitted by appointment having had no trouble since discharge except occasional dull pain in left flank. Drainage incision well healed. Hemoglobin and white blood cell count normal. Urine - cloud of albumin, many red and white blood cells.

10-16-34 - Left kidney removed. Post-operative course uneventful.

10-28-34 - Discharged.

O.P.D.

11-8-34 - No complaints.

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J.A.M.A., 83: 2074-2078, 1924.
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genological and clinical study.
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These papers taken together furnish a series of 289 perinephritic abscesses with the diagnosis proved at operation or postmortem.

IV. LAST WEEK

Date: February 13, 1936

Place: Nurses' Hall,
Recreation Room.

Time: 12:15 - 1:15 P.M.

Program: Movie: Plant Growth
Pyuria in Children

Present: 115

Discussion: Irvine McQuarrie
Arild Hansen
C. D. Creevy
H. A. Reimann
Frankwood E. Williams

V. WHALING

We are indebted today to John T. Litchfield, Jr., senior medic, for an illustrated account of his vacation last summer. In company with Dr. E. M. K. Geiling, Professor of Pharmacology and head of the department at the University of Chicago, he left Minneapolis in June by train for Winnipeg, and then to Prince Rupert, B. C. They continued their journey by boat to the Station of the Consolidated Whaling Company of America on Queen Charlotte Islands, B.C., 80 miles south of the southernmost point of Alaska. The crew of 90 men had been there since March and April preparing for the whaling season. With the exception of the boat crews, most of the employees are Japanese and Chinese. The boat crew captains are Norwegians and the engineers are Scotchmen.

Prior to the opening of the season, the docks are repaired and the very old Norwegian boats put into running order. An average season's catch varies from 110 to 175 whales. They weigh a ton to the foot in length and vary from 40 to 90 feet in length. More sperm whales are found here than in any other place in the world (except the Antarctic). The whale is often sighted from one mile to five miles away. He is hit by the harpoon shot from a cannon just as he dives with his back arched. A strike in the heart or lungs is desired. He lives from five to ten minutes and is then brought to the boat with a heavy hawser attached to the harpoon. As the whale sinks, he is quickly brought to the surface where he is injected with air from a compressed air supply through a needle (piece of gas pipe, 20 feet long, with a sharpened end). The tail is next tied to the bow and he is towed to shore. One boat can bring in four whales at a time.

The slaughtering docks smell very much like a stockyard (don't forget the whale is mammal). Large strips are cut out and pulled off with a cable (blubber). This is next shredded and rendered with steam in tanks. The oil is stored in large tanks where it is pumped into oil tankers. Finbacks and a related species, the Antarctic whale, are edible and

taste like blue ribbon beef. The sperm whale is not edible as it is too greasy. The scientific purpose of the trip was to collect pituitary whale glands (the anterior lobe weighs 30 grams, the posterior lobe 7 grams. (There is no definite pars intermedia as it is scattered in areas throughout the anterior lobe.) Pure posterior lobe tissue is thus available for a biological assay for hormones. The only other animal with a similar pituitary gland is the chicken. Other organs were collected for investigators throughout the country. These enormous organs are unbelievably large, a kidney weighing as much as 400 lbs., the liver 1,000 to 1,500 lbs. A two foot long fetus was also obtained (a newborn whale is about 10 feet in length). Arteriosclerosis was seen in one of the kidneys.

Oh yes, the oil is used for soap, the rest is used for bone meal and fertilizer.

VI. VISITORS

Thirty members of the faculty of the Medical School of the University of Manitoba, Winnipeg, Canada, will visit us Friday, February 21st and Saturday, February 22nd. A program, luncheon, and departmental visits have been arranged.

VII. INTERDEPARTMENTAL SEMINAR FOR MEDICAL RESEARCH

Eustis Amphitheater
Friday, Feb. 21, 1936
8:00 P.M.

1. The hay fever season of 1935, with an evaluation of specific treatment.
Ralph V. Ellis and C. O. Rosendahl. (20 minutes)
2. Bronchoscopic findings with pulmonary tuberculosis.
Herman J. Moersch. (20 minutes)
3. The prevention and treatment of tuberculosis.
Chester A. Stewart. (20 minutes)

4. The development of tuberculosis in young adults.

Jay A. Myers. (20 minutes)

Owen H. Wangenstein, Chr.
J. C. McKinley, Presiding

VIII. ALPHA OMEGA ALPHA LECTURE

The William W. Root lecture, under the auspices of Alpha Omega Alpha, will be delivered Monday, February 24, by Dr. George W. Corner, professor of anatomy in the University of Rochester. Subject: "Medicine in the Poems of Chaucer," Place and time: Medical Science Amphitheater, 8:15 p.m.

M. H. Manson, Secretary.

IX. SPECIAL LECTURE FOR MEDICAL STUDENTS AND OTHERS

Dr. Corner will address the students Tuesday afternoon, February 25th, at 3:30 in the Anatomy Amphitheater. His subject will be: "The Function of the Corpus Luteum and the Isolation of its Principal Hormone."

E. P. Lyon, Dean.

X. GOSSIP

The student reception of the Sigma Xi lecture series is well exemplified by the editorial in today's Daily... Back of each of these meetings there are certain men who provide the necessary information to settle debatable problems up for discussion. As an example, we are indebted to Richard Johnson for helping us with "calcium" for our Hyperparathyroidism meeting, and to Arild Hansen for assistance last week in preparing "Pyuria in Children.".....J. C. Litzenberg is packing his bag preparatory to joining our faculty men who are making addresses in warmer climates. His first stop will be New Orleans, arriving just in time for the Mardi Gras. Director Amberg, Radiologist Rigler, Dean Lyon, Dean Diehl and others have been away attending meetings..

....Mr. Mac Wetherby has been invited to address the International League for the Study of Rheumatism in Stockholm next August. The organization is especially interested in learning about our x-ray studies as a means of differentiating the various forms of arthritis. It is to be recalled that our studies indicated that the ordinary distinctions made between the various forms of arthritis cannot be made if all the joints are studied simultaneously..... ..The recent interest in high fat diet in the treatment of diabetes as not so good has been extended to the excessive use of fat as a precursor of diabetes. One investigator points out that when our peasant ancestors left their carbohydrate diets behind and adopted the fat of the land of their choice, they became subjects for diabetes. The Italian who brought with him his spaghetti shows similar rates in both countries. We intend to have more about this later at one of our meetings.....As occupational outlets for university men grow less and less, it is interesting to note the fields they are getting curious about. There has been a steady increase in demand for information about male nursing courses. Although Minnesota offers none, graduates of accredited schools may take the examination for registration. A large number of schools are to be found in Illinois, Iowa and Michigan. In Sioux City, Iowa all three hospitals admit both men and women. It will be interesting to note whether or not they will invade the administrative field of nursing....Bjarne Pearson is doing well at Huey Long's University in the pathology department, according to word received from Scotty Hamilton, one of the Tulane-Minnesota boys.....The Medical Six-O'Clock Club, all-medic organization, is having its winter dinner in the near future. Tommy Bell will be the toastmaster. This is one of the oldest medical campus organizations and anyone interested in medical education is invited to attend.

Adios.