Acromegaly

Volume VI | Thursday, March 14, 1935 | Number 21

UNIVERSITY OF MINNESOTA HOSPITALS
Volume VI Thursday, March 14, 1935 Number 21

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C O U R T E S Y O F C I T I Z E N S A I D S O C I E T Y

I. CASE REPORT

TUMOR OF PITUITARY GLAND WITH ACROMEGALY

Case is white female, 42 years of age, who gave the following history:

Onset

1921 - Severe headaches, gradual increase in size of hands and feet.

1931 - Disturbance in vision.

Admitted

4-5-32 - Physical Examination: Enlargement of hands and feet. Skin thick and rough. Lower jaw enlarged. Prognathism. Eye grounds negative. Suggestive bitemporal hemichromatopsia. Laboratory: Urine - negative. B.M.R. +8. Blood calcium and non-protein-nitrogen normal. X-ray - characteristic tufting of terminal phalages, marked enlargement of sella with thinning of posterior clinoids and depression of the floor. Course: Given deep x-ray therapy.

5-10-32 - Discharged.

Readmitted

6-21-32 - Interval History: Little or no improvement. Headaches became more severe. Has pain in hands and feet. Nauseated at times. Given more x-ray treatment.

7-16-32 - Discharged.

Readmitted

8-25-32 - No progress in acromegalic tendencies. Visual fields have apparently improved. It is decided not to give any more x-ray therapy at this time.

8-28-32 - Discharged.

Readmitted

1-15-34 - Vision within normal limits. Further x-ray therapy given.

1-27-34 - Discharged.

Readmitted

6-2-34 - Has become weak and has developed difficulty in walking (staggering gait). Several attacks of nausea, vomiting and pain in abdomen. Headaches have become worse. Confined to bed for 11 weeks before admission.

Operation

6-22-34 - Tumor not definitely visualized (apparently had not broken through the diaphragm sella). Erosion of anterior and posterior clinoids noted. Few hours after operation, there is increase in respiratory and pulse rate. Blood transfusion given. Gradually grew worse.

6-24-34 - Expired.

Autopsy

Body is white female, 42 years of age. Features of acromegaly already noted in the clinical history.

Heart weighs 390 grams. Slight left ventricular hypertrophy.

Right Lung weighs 750 grams, left 600. Both lungs are nodular. There is consolidation in the bases, posteriorly.

The Spleen weighs 150 grams.

The Liver weighs 1800 grams.

The Pancreas shows no fibrosis or adenomas.

The Adrenals are well-developed.

The Ovaries contain no cysts. The uterus is of normal size.

Head: Osteoplastic flap over left fronto-parietal area. No evidence of hemorrhage. No meningitis. Diffuse area of softening over tip of frontal lobe. Remainder of brain shows no change. Sella turcica is markedly enlarged, 2.5 to 3 cm., filled with reddish, soft tumor which is partially liquefied. The diaphragm sella is pushed upward. The clinoid processes are eroded.

Microscopic: Section of softened area in right temporal lobe shows infiltration with small round cells. No definite evidence of tumor. Pituitary gland is enlarged and in the central portion contains a hemorrhagic tumor composed of large cells with practically no underlying stroma. The cells are often multinucleated and there is evidence of amitotic division. The granules in the cytoplasm are fine and stain a violet to

brownish-red. The granules do not stain as intensely as the granules in the eosinophils in that part of the gland which is not infiltrated by tumor.

Diagnosis

1. Probably eosinophilic adenoma of pituitary with acromegaly.
2. Bilateral bronchopneumonia.
3. Encephalomalacia, cause undetermined.

II. CASE REPORT

PITUITARY TUMOR WITH ACROMEGALY

Case is white male, 29 years old.

Acromegaly

1927 - Pain over right side of head and face. Feet have grown larger and wider. Hands have become larger and fingers club-like. Prominence of lower jaw has become noticeable.

1928 - Blurring of vision when reading.

Exploration

7- -32 - Discharged from another hospital after unsuccessful attempt at pituitary operation.

Admitted

4-5-33 - In interval, had x-ray therapy which did not seem to relieve his symptoms. His visual acuity has been decreasing rapidly. Physical examination: Well-developed, well-nourished. Prognathism. Large hands, feet and tongue. X-ray - skull somewhat enlarged. Sinuses greatly increased in size. Sella turcica: marked enlargement, depression of the floor and thinning of the posterior clinoids. Tufting of terminal phalanges of hands.

Neurologic consultation:

Patient has a pituitary tumor which is progressive. The visual fields do not suggest a chiasmal or tractus lesion but rather optic nerve compression. The signs of acromegaly are unmistakable and optic nerve syndromes occasionally occur with such tumors. Exploration advised in order to prevent blindness and relieve headaches.

Operation

5-6-33 - Cyst in the region of the pituitary aspirated. Postoperative convalescence uneventful aside from a small hematoma under the scalp.

Discharged

5-22-33 - with advice to return to Tumor Clinic for follow-up.

Since that time, has had occasional attacks of headache, his visual disturbance has been practically stationary.

III. CASE REPORT

ACROMEGALY. DIABETES MELLITUS

Case is 52 year old, white male admitted 12-22-28 and discharged 1-16-29.

Onset

1921 - First noted that he did not feel as well as usual and could not work.

Diabetes

1928 - Polydipsia, polyuria and loss of weight. Urine was found to contain sugar. Dimness of vision.

Admitted

12-22-28 - Physical examination: characteristic facies and broad, spade-like hands. This, according to the patient, had been slowly progressive for 30 years. Visual fields normal.

Laboratory

Urine - 4+ sugar, acetone and diacetic +. Blood sugar .408 mg. %. X-ray: The jaw appears markedly prognathous. Marked enlargement of the sella turcica and thinning of the posterior clinoid processes. Tufting of the phalanges of the hands and feet. Course: Given treatment as a diabetic with diet and insulin. Responded fairly well. Urine returned to normal and blood sugar fell to normal.

Discharged

1-16-29 - with advice to continue diabetic management.

IV. ABSTRACT

ACROMEGALY

By Alex Blumstein.

Definition

"Acromegaly, then, is a chronic disease of adult life, outwardly characterized by the acral changes first emphasized by Marie. The pituitary body, though not invariably enlarged, is usually, and sometimes enormously so, by an hyperplastic or adenomatous process composed of acidophilic cells. It is these granular cells which elaborate or at least hold a hormone which injected into certain animals provokes overgrowth (gigantism), and which are almost certainly the cause of acromegaly and gigantism in man.

"As an accompaniment of the disease, there usually occurs a general spanchnomegaly of the viscera which is disproportionate to the general enlargement of the body. In addition, notable glandular changes often associated with adenomata, occur in the other endocrine organs, which gives to the malady its unusual polyglandular aspects. There is almost always an increase in the adrenal cortex; usually an enlarged or persistent thymus; in about a third of the cases a colloid goiter; often enlargement of the parathyroids; often a functional derangement of the pancreatic islets; and invariably changes indicative of atrophy or dysfunction of the gonads."

Rockefeller Institute for Medical Research 19 - 22 : 126, 1927.

In 1886, Marie described two cases of this condition to which he gave the name of acromegaly.

Signs and Symptoms

Davidoff has analyzed 100 cases of acromegaly discharged from the Peter Bent Brigham Hospital.

1. Incidence: The disease is rare. Two out of every 1,000 admitted to the hospital, and approximately one out of every five with a diagnosis of pituitary disorder presented this condition.

In Cushing's series, pituitary adenoma represented 18% of all intracranial tumors (360 out of 2,023). Of 162 cases of hypophysial adenomata of the Brigham Hospital series, 39 were clinically acromegalic, and in all but 4 an eosinophilic adenoma was identified. The tissues from the remaining 4 had been improperly fixed.

2. Race: Davidoff notes that 21 of a hundred cases of acromegaly were Jews. The relative proportion of Jews in the American population according to the 1920 census was 3.4% (cited by Davidoff).

3. Sex: There were 44 males and 56 females, and in other series cited by Davidoff the disease was almost equally proportioned between the sexes.

4. Age: The average age at which patients came into the clinic was slightly above 40 years. According to Davidoff, the age of onset in by far the larger number of cases was in the third decade.

5. Family History: In 4 cases a "definite history was obtained of acromegaly affecting a near relative." Curschmann and Schipke report a family with "akromegaloider Konstitution" in which one case of acromegaly was manifested. Davidoff states "while far from leading one to conclude that acromegaly is a familial disease, the information at hand at least suggests that certain propensities in a given family may become sufficiently exaggerated in one or two families to give rise to this condition."

Symptoms

Davidoff lists the following symptoms:

Endocrinology 9 - 10 : 469, 1925-26.

Symptoms and Signs of Acromegaly as Recorded in Clinical Histories

Symptoms	Incidence
Enlargement of acral parts	100%
Enlargement of sella turcica on x-ray examination	93
Disturbances of menstrual cycle	87*
Headaches	87
Complete amenorrhoea	73+
Increased basal metabolic rate	70‡
Visual disturbances	62
Excessive perspiration	60
Hypertrichosis	53
Cutaneous pigmentation	46
Drowsiness and lethargy	42
Gain in weight	39
Diminished libido sexualis	38
Asthenia	33
Low blood pressure (less than 120 mm. Hg. systolic)	30
Paraesthesia	30
Polyphagia	28
Fibromata mollusca of skin	27
Polydipsia	25
Enlarged thyroid gland	25
Glycosuria (diabetes mellitus 12)	25
Constipation	20
Vomiting	16
Rhinorrhoea	15
Photophobia	12
Uncinate attacks	7
Failing memory	7
Decrease of body hair	7
Persistent lactation	4
Failure of breasts to develop	4
Epistaxis	3
Choked discs	3

* Percentage of female patients.
\+ Percentage of female patients.
‡ Percentage of 70 cases examined.

1. Eye symptoms: (100 cases). Pressure against the chiasm, 56 cases; 16 others had either early signs of chiasmal pressure insufficient to warrant operation at the time, or signs sufficiently advanced to justify intervention which for one reason or another was postponed. In the remaining 28 cases, there was no perimetric evidence whatsoever of chiasmal involvement. The disturbance consists usually of "symmetrically disposed defects in the fields which progress downward until the typical bitemporal hemianopsia or even a more advanced stage of the process is produced." Rarely, there is a homonymous hemianopsia or choked disc.

2. Disturbance of Menstrual Cycle: There was usually a complete amenorrhea by the time the patient first came under observation. Some of the patients continued to menstruate quite regularly in spite of advancing acromegaly.

3. Metabolism: The basal metabolic rate is usually above normal. Of 73 cases, the basal metabolism rate was above normal in 50 and below normal in 23. In the more common chromophobe adenoma not associated with acromegaly, the basal metabolism rate is usually subnormal.

4. Glycosuria: Twenty-five patients gave a history or proved on examination of the urine to have glycosuria; 12 had clinical diabetes mellitus.

5. Hypoglycemia: Wilder cites an instance of "abortion" acromegaly with hypoglycemia.

6. Persistent lactation over a period of years occurred in 4 of 100 patients.

7. Osteoporosis: W. de M. Scriver and A. H. Bryan described an advanced case of acromegaly showing generalized rarefaction of the bones. They did not find complete evidence which would point to parathyroid involvement but explained the osteoporosis on "an insufficient intake of calcium and phosphorous associated with a moderate increase in excretion in the urine during the years of acromegalic growth."

Clinical Course

This is practically always a chronic disease. Davidoff divides the clinical course of the disease into three parts.

1. Early period characterized by an increase in size of the acral parts and usually the bony framework. Irregularity of the menstrual cycle or complete amenorrhea. These are the most constant symptoms and in the majority of

cases the first manifestation of the disease.

2. Second period is characterized by neighboring symptoms resulting from pressure of the adenoma, especially on the optic chiasm.

3. Final or third period. A conglomeration of symptoms and signs ascribable to the late effects of visceral splanchnomegaly and to the effect of other endocrine organs, as well as to the pressure effects on neighboring structures.

X-ray

This usually though not invariably shows changes in the sella turcica. In 100 cases reported by Davidoff, 93 showed sellar changes on x-ray. There is thickening of the skull which, according to Rowe and Mortimer, is due to over-expansion of cancellous bone. There is enlargement of the paranasal sinuses and deformity of the jaw. The hands and feet are enlarged and there is tufting of the terminal phalanges.

Relation of Hypophysis to Acromegaly

It is a generally accepted view that the part of the hypophysis affected in acromegaly is the anterior lobe. "The average weight of the main body of the hypophysis, including a variable amount of connective tissue or capsule, is 570 grams" (in the normal male adult). Of the three types of cells, the chromophobes represent on an average 52% of the total, the acidophiles 37% and the basophils 11%.

The pituitary body is usually though not invariably enlarged in acromegaly. In those cases in which the gland reaches a size sufficient to demand operation, there is practically always an eosinophilic adenoma. "The normal acinous structure tends to be lost; the cells lie in a loose mass, practically without stroma; the nuclei vary greatly in size and as many as half a dozen may be present in one cell; the cells contain alpha granules which are finer than the normal alpha granules and which tend to collect in the periphery of the cytoplasm."

Treatment

Cushing favors a transfrontal approach to the tumors of the hypophysis. He points out that the changes of improving vision are greater by this approach than by the transphenoidal route. Also by the transfrontal route, one can determine whether extracapsular extension has taken place. The transfrontal procedure offers a better view of the entire operating field. In the transphenoidal route, there is a risk of meningitis. In the transfrontal approach, there is liability to postoperative clot. In 38 cases of chromophile adenomas (1921 - 1931), there were 3 transphenoidal operations with 2 fatalities and 9 transfrontal operations with 2 fatalities. The death rate for acromegalic patients was higher than for cases of pituitary adenoma without acromegaly.

Cushing states that the chromaphile adenomas appear to be more definitely susceptible to radiation than the chromophobes.

Causes of Death

In 44 autopsied cases listed by Cushing and Davidoff, there were 11 instances of diabetic coma and 7 of cardiac failure. The remainder were due to scattered causes.

Postmortem Findings

In 4 cases studied by Cushing and Davidoff, the only constant pathologic findings were:

(1) The commonly recognized overgrowth of the mesodermal tissue.
(2) the less commonly emphasized and disproportionate splanchnomegaly, which chiefly affected the liver and kidneys.
(3) the more or less general polyglandular anomalies accompanied by a tendency to adenomatoses.
(4) a central hyperplasia (two cases) or an adenoma of the hypophysis (two cases), the cells composing the lesion in all four instances containing demonstrable acidophilic granules."

Table Contrasting Weights of Normal and Acromegalic Organs.

	Height	Weight	Lungs	Heart	Liver	Kidneys	Spleen	Thyroid	Thymus	Adrenals	Pancreas	Gonads
			Gm.	Gm.	Gm.	Gm.	Gm.	Gm.	Gm.	Gm.	Gm.	Gm.
Normal male	172 cm.	70 Kg.	920	350	1500	300	200	45	144	12	80	22
Normal female	155 cm.	55 kg.		250								14
Case I: male aged 52 duration 30 yrs.	185 cm. 6'2"	97 kg. 213 lbs.	2550	1050	3150	853	535	310	(?)	43	225	73
Case II: male aged 40 duration 13 yrs.	198 cm. 6'6"	122.4 kg. 269 lbs.	1930	480	3380	565	385	105	8.2	43	83	23
Case III: male aged 35 duration 20 yrs.	173 cm. 5'8"	100 kg. 220 lbs.	(?)	1000	2480	650	(?)	100	78.0	30	150	(?)
Case IV: female aged 51 duration 21 yrs.	157.5 cm. 5'2"	68 kg. 151 lbs.	(?)	460	2500	695	240	(?)	(?)	18	(?)	18

Largest recorded weights	Osborne	Osborne	Dallemagne	Dallemagne	Lewis	Geddes	Schultze Case III	Schultze	Launois	(?)
	2922	5900	1170	1170	1169	312		57	250	

Endocrine Series

1. Hypophysis

"In one (Case I) was a gland of normal dimensions in the centre of which is an adenomatous-like accumulation of chromophilic cells; Case IV was a gland which has evidently shrunken greatly in size and which contains a similar centrally disposed adenoma; in Case II a huge adenomatous mass had extended into the intracranial chamber leaving no demonstrable trace of the original glandular structure; in Case III there still remains a normally composed though flattened hypophysis from which a huge intracranial adenomatous mass had expanded laterally into the temporal lobe."

2. Thyroid

Cushing and Davidoff state "acromegaly is often accompanied by an adenomatous and enlarged thyroid; but whether actual exophthalmic goiter may exist is a question of doubt even though examples have been described in the literature." The enlargement proves histologically in the large majority of cases to be of the colloid type.

3. Thymus

A persistent thymus is a common postmortem finding. In all 4 of Cushing's and Davidoff's series, thymic tissue was demonstrable. In one case, the thymus weighed 78 grams.

4. Adrenals

"In all 4 cases, these organs were greatly enlarged, and 3 of them had adenomata of cortical tissue.

5. Pancreas

The organ may become disproportionately enlarged and participate in the general splanchnomegaly. In one case (Cushing and Davidoff), the pancreas weighed 225 grams.

Summary

1. Acromegaly is usually, though not invariably, associated with an eosinophilic adenoma of the anterior lobe of the hypophysis.

2. In a fairly large percentage of cases, there is an associated diabetes mellitus.

3. The disease is rare and often follows a very chronic course.

4. Approximately one out of five individuals with pituitary disorder present this condition.

5. The average age of onset is in the third decade.

6. The most constant signs are enlargement of the acral parts, enlargement of sella turcica, disturbance of menstrual cycle, headache, increased basal metabolic rate and visual disturbance.

7. In a large number of cases, there is a perimetric evidence of pressure on the chiasm. The characteristic change is a bitemporal hemianopsia. Other field defects may occur.

8. The characteristic ophthalmoscopic finding is primary optic atrophy.

9. X-ray usually shows changes in the sella turcica and tufting of the phalanges.

10. Diabetic coma and cardiac failure were the two most frequent causes of death in 44 autopsied cases.

11. Pathologically, there is overgrowth of the mesodermal tissue, splanchnomegaly, polyglandular anomalies, a central hyperplasia or an adenoma of the hypophysis.

12. In some instances, vision may be preserved and headache relieved by proper operative intervention.

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V. STAFF MEETING

Date: March 7, 1935

Place: Recreation Room, Nurses' Hall

Time: 12:15 to 1:15

Attendance: 96

Program: Benign Gastric Tumors

Discussion: L. G. Rigler
Richard Johnson
Alex Blumstein
J. B. Carey

Theme: L.G.R.: The first case reported illustrates the characteristic findings. Lower tumor sharply outlined. Diagnosis made of papillary benign tumor. Diagnosis made because of extension of barium into substance of tumor suggesting papillary outgrowth. Two other defects present. Case has interesting sidelight. Dr. S. operated upon patient. When stomach was opened found "meat" in the stomach. Dr. S. called intern on carpet for giving patient ham for breakfast. Frozen section of pieces proved them to be detached polyps. Excision locally taking mucosa only. No resection of the stomach done. General experience reported since

indicates resection should be done. At that time local resection seemed sufficient. On pathological examination tumor proved to be benign papillary lesion. The picture of the specimen illustrates how roentgen picture faithfully reproduces the lesion. This patient later had evidence of metastasis in the liver and lymph nodes so that there was no question of carcinoma later. We have had a number of such cases. One particularly on x-ray examination showed characteristics of benign lesion. Operation advised. Refused. Came back later with evidence indicating malignancy. Stomach later showed small polypi which, on microscopic section, showed malignancy.

Next case of interest chiefly because of association of two conditions. X-ray examination done not because of gastric symptoms but because of unexplained anemia. In this instance there was found a round, sharply defined, filling defect. Importance of technic illustrated here. It is easy to miss that. In one series of films one would be at a loss to find any evidence of tumor. In another series of films, with different technic, classical evidence of tumor. Round, smooth, mobile, walls flexible, peristalsis present. Tumor and fracture of shaft of humerus found later. Metastasis from the stomach difficult to rule out. Two independent diseases occurring in the same individual found at autopsy.

Next case illustrates virtues and shortcomings of x-ray of the stomach. Spastic closure at pylorus. Patient had considerable retention. X-ray evidence of some type of inflammatory process around the pylorus. First thought to be ulcer. Later found in the defect rounded, punched out area like carcinoma. When patient came to operation, striking feature was the absence of palpable findings. At our insistence stomach wall opened, and small induration in the pylorus found. Resection done. This one, the lesion we called carcinoma, proved to be a benign, cystic disease of the pylorus as shown in the slide. (DR. BLUMSTEIN: Stomach has been cut in this manner to show the pyloric end. These two areas are small cysts. One is cyst multilocular. Wall shows fibrous tissue. No evidence of malignancy. No acute inflammatory reaction.)

This case illustrates that we can diagnose the presence of a lesion almost every time but we cannot always tell the nature of the lesion.

We have been interested in this particular subject for a long time. In 1924, Henry Christian, Boston, appearing at a meeting, made statement which has since been widely misinterpreted. He said that x-ray examination of stomach had added nothing to diagnosis of stomach. Actually, he meant to say it added very little to the cure of carcinoma of the stomach. Dr. U. had been at this meeting and reported this with a certain degree of glee because he had always emphasized to the students importance of clinical examination. Not very long after that we got a case which came to autopsy which gave best answer to that statement. Patient came in with large carbuncle, showed evidence of diabetes and extreme anemia. Went to x-ray and in the course of examination carcinoma of stomach found. No symptoms at all. About six months later diagnosis confirmed at autopsy.

We have gone over our cases with a view to determining the frequency of the condition. It was said that benign tumors exceedingly rare. Our experience has been very different. After going over our case carefully we eliminated all questionable cases and the incidence by x-ray was over 10%. In order to check over this further, Dr. Erickson went over figures of the Department of Pathology. In looking over large number of autopsy cases incidence was over 25%. Searching the pathological examination might reveal some areas of malignancy but grossly they appeared to be benign. Benign tumors particularly of polypoid type are progenitor of carcinomas of stomach. Search for benign lesions represent in a sense opportunity of making earliest diagnosis of carcinoma of the stomach. Surgical statistics on carcinoma show about 1/2 are inoperable when surgeon sees them. Of those he thinks operable only 1/2 again prove to be operable. Recognition of benign lesions in the stomach represents the opportunity to diagnose malignancy in its early inception. It is our belief that these benign tumors should be

radically extrapated because some are going to become malignant.

Question: Do you think single polyps of the stomach in the same category as multiple ones?

L.G.R.: Difference of opinion in the literature. Multiple polyps become malignant. Personal experience small. In the literature diffuse multiple polypi of the stomach are frequently malignant already when you see them. Single polyps benign but chance of becoming malignant good. Operative procedure and autopsies necessary before we can be certain.

R.J.: Clinically there is a history of intermittent pyloric obstruction. Decide before surgery whether benign or malignant. Certainly we can't ask surgeons to decide on the malignancy of these lesions at the time of operation. We have to either let lesions alone or else resect stomach.

A.B.: I followed one case Dr. Rigler saw 2½ years ago. Male, about 40 years old, who was in good health. One evening, about 8 o'clock, seized with severe pain in the abdomen. Did not vomit, went to bed. He said he felt somewhat feverish. Later on had pain in the epigastrium, radiated a little bit so that it localized a little to the right. Saw him next morning, had slight fever, leukocytosis between 15,000 and 17,000. He said he had anorexia, little tenderness in the epigastrium, tenderness to the right of the umbilicus about the same level. Taken to hospital as possible appendicitis. Surgeons thought there were not enough findings to make diagnosis of appendicitis. Suggested x-ray examination. He thought patient might be getting slowly perforating gastric ulcer. Typical benign tumor found. The man has not had any more attacks for 2½ years. He is not losing weight. He had no free hydrochloric. Most of them don't.

J.B.C.: Procedures differ in dealing with benign tumors of the stomach. 6 or 7 years ago, middle-aged woman operated upon. Polyposis of the stomach found. There were 30 or 40 of these, some fairly large, some rather pedunculated, some above the surface. The larger ones, particularly those around the pylorus, removed, none of them had penetrated through the mucosa. Base cauterized with diatherm. Smaller ones not removed but cauterized. Debated after we got through what mucosa would be like. After 6 years apparently all right. Seen last only few days ago.

L.G.R.: Everybody agrees that the diffuse polyposis remains benign. That group shows stomach at x-ray like sponge. Stomach involved from cardia to pylorus. Frequently involve tremendous portion of mucosa. Dr. Blumstein's case illustrates problem. In his case at least half the stomach would have had to be removed. One would hesitate to do this no matter how good a condition patient is in. Patient followed carefully. Without operation has remained perfectly stationery. It may be perfectly all right to go on treating him conservatively.

VI. MOVIES

Title: The Killers

Released by: The Fox Motion Picture Corporation

VII. BENEFIT BRIDGE

The Surgical Nurses will give a Benefit Bridge Tuesday, March 19 at 8:15 P.M. in the Nurses' Hall. The proceeds will be devoted to the library fund. Make up your own table or purchase an individual ticket. Admission 25¢ per person. Refreshments will be served.

VIII. SPECIAL LECTURE

The Honorable O. J. Hagen, Regent of the University of Minnesota, will address the student body at 2:00 P.M. today on the subject "Jaundice."

Dr. Hagen is one of the distinguished members of the Board of Regents, whose home is in Moorhead.