

Spontaneous Rupture of the Small Bowel in Adults

Report of Two Unusual Cases

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UNEXPECTED perforation of the small bowel is of infrequent occurrence. In our 435 bed hospital only five cases of spontaneous rupture of the small intestine have been encountered over the past 15 years. Rupture due to trauma, accidental injury during an operation, typhoid ulcer, severe and prolonged distention, localized gangrene, ingested foreign bodies (crab shells, nails, toothpicks, etc.) simple ulcer of the jejunum, diverticulitis, neoplasia of primary or contiguous origin^{1, 2} are well recognized causes of peritonitis. Since in three of our cases, obstruction and external trauma appear to be related to the subsequent perforation, we have not included these cases in the present presentation. The two remaining cases were encountered by the authors in the past year. One represents a spontaneous perforation of the jejunum of undetermined etiology. Mason,³ in 1955, collected 50 cases and added four of his own in which small bowel perforation occurred without an apparent etiological factor. Cronin⁴ in 1960, stated that his review of the literature showed only three cases of spontaneous rupture of the small bowel. Both of these reviews included cases found only in adults. We shall not concern ourselves with the discrepancy in the foregoing reports at this time, beyond support that the condition is uncommon. The second case represents a rupture of the terminal ileum secondary to a solitary metastasis from the lung. To our knowledge, this represents the lone case report diagnosed antemortem and documented in the literature.

CASE REPORTS

I.H. 199-568 This 44 year old male truck driver was admitted to the medical service late on the evening of 4-3-61 with an impression of bilateral broncho-pneumonia with diaphragmatic pleurisy. He complained of a cough

productive of whitish sputum and fever with chills of three weeks duration. These symptoms were associated with anorexia and a 10 pound weight loss. Beginning at 6 o'clock A.M., four days prior to admission, he experienced an intermittent right subcostal pain aggravated by respiration. An increase in belt size had also been noted.

The past history revealed that the patient had often imbibed one pint of whiskey and smoked one package of cigarettes per day. He had also been treated for urethritis 16 years ago.

On examination he was tachypneic with a respiratory rate of 32 per minute. The BP was 130 systolic and 90 diastolic. A pulse of 108 per minute and an oral temperature of 102° F were recorded. Auscultation of the chest revealed bibasilar fine moist rales and the PA roentgenogram showed elevated diaphragms with bibasilar plate-like areas of atelectasis. The abdomen was distended with generalized muscle guarding. Tenderness was located predominantly in the right lower quadrant. Flat and erect films of the abdomen revealed a patchy distribution of air in the small and large bowel and feces in the colon. A haze was present in the pelvis and right iliac fossa but no free air was present beneath the diaphragm. Rectal examination suggested some fullness in the cul-de-sac.

Admission laboratory data showed a WBC of 12,900, a hematocrit of 32%, 10.5 grams % hemoglobin and urinalysis with 1.023 specific gravity and 3 plus albumin (3% sulfosalicylic acid). Many bacteria and 4-6 WBC per HPF were seen. Urine culture subsequently grew enterococcus and klebsiella species sensitive only to Kantrex. The BUN was 11 mgm% and serum amylase 35 Somogyi units. The fasting blood sugar was 70 mgm% (Folin-Wu) and the serological test for syphilis was negative. Gram stain smears of the nose and throat revealed gram positive cocci and diplococci. The blood culture showed no growth.

The patient was given aqueous and procaine penicillin and streptomycin with intravenous fluids and occasional mild analgesia.

After 10 hours of conservative therapy the abdominal complaints overshadowed the pulmonary findings. Surgical consultation was had and the findings reviewed. The chest findings were stable. There had been no nausea, vomiting or disturbance in bowel habit, one green and one black stool had been passed on the day

prior to admission. Foreign body ingestion, contact with tuberculosis or previous episodes were not present. The abdomen at this time showed direct and rebound tenderness especially in the right lower quadrant. Positive Rovsing, obturator and psoas signs were present and rectal examination revealed a definite boggy cul-de-sac. No organomegaly or liver tympany was found. There was no evidence of hernia.

With an impression of pelvic peritonitis with abscess secondary to a ruptured appendix the patient was explored through a McBurney incision.

No free air was encountered. A thick fibrinopurulent exudate covered the surface of the bowel and a purulent pelvic abscess was drained. The 12 centimeter retrocecal normal appendix was mobilized and removed. The distal ileum was normal except for the surface exudate. Since the peritoneal soilage appeared to be originating from the upper abdomen an upper midline incision was made after closing the McBurney to skin level. After finding a normal stomach and duodenum the intestine was traced distally. The distal jejunum was adhered by the fibrinous exudate and a 1.5 centimeter rent on the antimesenteric border was sealed by attachment to the anterior abdominal wall just to the right of the umbilicus. A segmental resection of the involved segment was done with an open end-to-end anastomosis.

The post-operative course was relatively uneventful. The serum amylase was recorded as 428 Somogyi units (normal 80-150) on the first post-operative day. The temperature was flat beginning with the fourth day post operative and the serum amylase was 178 units on 4-14-61, the day of discharge.

Interestingly enough this patient was well for 8 months with return to normal employment. On 1-5-62 he was admitted to another hospital where a left frontal brain abscess was drained of 60cc. of pus. Culture showed microaerophillic streptococcus. Culture report of the peritoneal exudate of 4-4-61 revealed no growth. The etiology of this patient's brain abscess is presently undetermined. The significance of the relationship between the two episodes is not apparent.

Pathology report of the segment of small intestine showed a subacute and perijeunitis with perforation.

COMMENT

This patient well illustrates the problem frequently encountered in differentiating the dominant cause of symptomatology when there is present disease states in both the abdominal and the thoracic cavities. The abdominal findings, with the exception of fullness in the cul-de-sac, are seen with a basilar pneumonitis frequently. Progression of signs of peritonitis was the main finding resulting in exploratory laparotomy.

The diagnosis of spontaneous rupture of the small bowel is rarely made preoperatively. Rose and Fowler⁵ report a correct diagnosis made in

two of six cases. Markowitz⁶ in a review of 27 cases of less common perforations of the small bowel states that in no case was the correct diagnosis made pre-operatively. Wilensky and Kaufman⁷ in a report of 41 cases of subparietal rupture of the small intestine, found only one in which the correct preoperative diagnosis was made. A right inguinal hernia was present in this case and free air located beneath the right leaf of the diaphragm. They⁷ reviewed the literature to 1937 and found 40 cases of spontaneous rupture of the small intestine and added one of their own. The incorrect preoperative diagnosis was either incarcerated hernia, internal incarcerated hernia, appendicitis, perityphlitis, perforated gastric ulcer, 'complications of hernia,' or peritonitis of uncertain origin.

Today the majority of these patients will be explored with a preoperative impression of appendicitis with rupture or perforated peptic ulcer of the stomach or duodenum.⁶ There are two reasons for this. First, spontaneous rupture of the small bowel is a rare finding while the other diseases are encountered frequently. Secondly, the only consistent finding in all of the cases is signs of peritonitis without an antecedent history or differentiating signs justifying a less common cause of peritoneal irritation.

Two findings have appeared frequently in patients with spontaneous rupture; the presence of a hernia, which is not necessarily complicated and a history of an increased abdominal muscular contraction. Of 41 cases reviewed by Wilensky and Kaufman,⁷ 33 had definite hernia. There were two cases without hernia and in six there was no record. In 38 of the cases there was the history of a sudden contraction of the abdominal musculature. The nature of the effort in the order of frequency was: lifting a heavy object, sudden effort to regain equilibrium after mistep or low jump, pulling or straining against resistance, straining during defecation or micturition and wrestling. Mason³ reported only two of his four cases with hernia and none with exertion other than vomiting associated with the onset of peritonitis. Markowitz⁶ had neither in his case as did Rose and Fowler⁵ in their six cases. Windham⁸ did not observe hernia in his two cases but one had a history of being struck in the abdomen with a piece of lumber some six days prior to admission. Cronin⁴

reviewed the literature and found only three cases that he classified as spontaneous perforation of the normal small bowel. In his report he cites a variety of cases which fall under the grouping of either: 1) patients with both a raised abdominal pressure and definite inguinal hernia 2) patients who had no definite inguinal hernia, but did have a raised abdominal pressure. In his Group III patients who had neither an inguinal hernia nor a raised abdominal pressure he suggested that the perforations were not only spontaneous but presently inexplicable. Yet in this group is included a patient with a left reducible inguinal hernia whose peritonitis was immediately preceded by the act of sneezing. In the three cases of small bowel perforation,⁴ two of the patients had inguinal hernia and in one its presence was not mentioned. Perforation is stated to have occurred in one patient during defecation, in one while straining to pass urine and in one while getting out of bed.

This case, although not having a hernia, did have increased abdominal musculature contractions associated with coughing for some two and one half weeks before the onset of abdominal pain. Since effort of defecation and micturition was mentioned by Wilensky and Kaufman⁷ we suggest the same association apply to rupture in this case. We further suggest the three cases which Cronin⁴ cites be also placed in this grouping.

The role of a demonstrable, abdominal aponeurotic defect for the egress of a viscus in the etiology of perforation of the small bowel is difficult to assess. Its frequent occurrence in spontaneous rupture is probably more than coincidental. If an analogy and relationship is accepted between the relatively increased intraluminal pressure produced by nonpenetrating trauma and that occurring due to increased muscular effort, then a filled hollow viscus is likely vulnerable to rupture. Counsellar and McCormick⁹ in a review of 1,183 reported cases of non-penetrating trauma found the small bowel, exclusive of the duodenum, perforated in 80 per cent of the cases involving the intestines. The frequency of occurrence of hernia and muscular effort when present (in the absence of findings supporting a more common cause of the peritonitis) should emphasize the possibility of spontaneous perforation of the small bowel.

Early operative intervention influences the prog-

nosis of these patients with rupture of the intestine. In no case has a spontaneous cure been cited. Inability to determine the etiology will naturally cause a delay in surgery as was true in the present case. This delay in establishing the diagnosis should always be governed by the patient's clinical response to the fulminant peritonitis. The best results will probably occur in those patients operated upon within 12 hours after onset. There is an increasing mortality in patients explored later than 12 hours.^{6, 7, 10, 11, 12}

Simple suture of the perforation which is usually less than one centimeter is favored by most writers.^{4, 5, 6} Resection of the involved bowel is considered rarely necessary by Mason.³ We feel, as does Markowitz,⁶ that while simple suture appears to suffice in most instances, resection of the diseased area offers two advantages. It first allows an exact microscopic evaluation, likely revealing an etiology missed on gross examination. Secondly, it certainly prevents re-perforation of an area of already diseased bowel.

CASE II.

C.C. 204-058 This 52 year old brick-hauler was first seen on 7-28-61 by a local physician because of pain in the left shoulder and lower back following stooping on his job. Home remedies for one week failed to relieve the pain.

For seven months the patient had a chronic "smoker's cough" which had been productive of a whitish sputum for the past three months. This was recently associated with night sweats in the absence of chills or fever but with a weight loss of 10-15 pounds. An x-ray of the chest revealed a right lung abscess.

Past history revealed an appendectomy 30 years ago and frost-bite to the face and ears in 1960. The patient had smoked one pack of cigarettes daily for years and had been a rather heavy imbiber of alcohol. One episode of delirium tremens two years ago was associated with pneumonia.

When the patient was seen some three weeks following the onset of back and left shoulder pain, physical examination revealed a blood pressure of 110/70, pulse 108, oral temperature of 103° F and a respiratory rate of 40 per minute. Weight was 135 lbs. and height recorded as 65 inches. Over the nose and ears were areas of hyperpigmentation. The chest was thin and there was dullness and decreased fremitus with dry and moist rales over the right upper lung field. The abdomen was scaphoid and a RLQ healed scar was present. No organomegaly or tenderness was noted. The rectal examination was negative. Over the left supraspinous fossa was a firm, non-tender, oblong 1.5 x 1 cm. mass suggesting a fibroma. There was apparent attachment of the mass to the skin but not to the deep fascia.

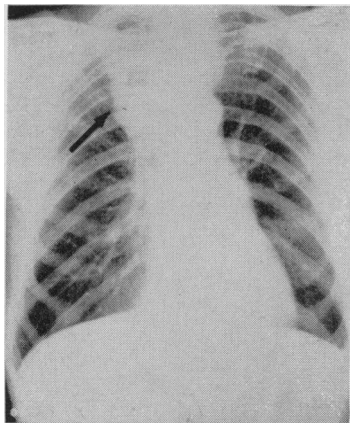


Fig. 1. (Case II) Plain film of the chest taken at six feet on August 22, 1961. To the right of the upper mediastinum and subjacent to the clavicle (arrow) is seen a homogenous density extending down to the upper border of the eighth posterior rib. A fluid-air level is present in the oblong density at the sixth posterior rib.

X-ray of the chest revealed a paratracheal lung abscess in the right upper lobe. (Figs. 1, 2). Lateral projection showed the abscess located anteriorly.

Laboratory analysis on admission showed a leucocytosis of 11,800 with a shift to the left. The hematocrit was 35%, hemoglobin 10.45 gms and RBC count of 3.9 million. Urinalysis revealed a pyuria with negative culture and a two plus albuminuria. The BUN was 12 mgm per cent.

Hyperpyrexia and leucocytosis with sepsis persisted in spite of hydration and antibiotics. Bronchoscopy and right scalene node biopsy on 8-24-61 were both negative. Culture and smear for AFB was negative and a Papanicolaou smear of the bronchial secretions was reported as Class III.

The mass on the left shoulder ulcerated and became painful being excised on 9-2-61. Pathology report cited squamous cell carcinoma, invasive and ulcerating, Grade III, with tumor cells close to the resected margin. On 9-8-61 a rebronchoscopy was still unproductive of a stenosing defect or excess secretions. A wider excision of the area on the left shoulder was also done. The pathologist reported residual carcinoma with all margins free of neoplasm. (Fig. 3.)

The patient's course continued to be marked by sepsis and progressive debility. On 9-12-61 he began to complain of persistent abdominal pain beginning in the right abdomen with greater intensity in the right lower quadrant. On first examination the abdominal findings were minimal with some localization in the RLQ. X-rays of the abdomen were considered non-contributory. The patient was given an enema. This was followed by a slow but progressive worsening of the abdominal discomfort. On 9-13-61 the abdomen was slightly distended with tenderness, rebound and fullness in the right lower quadrant. An erect film of the chest revealed free air beneath the right leaf of the diaphragm (Fig. 2). Leucocytosis of 15,550 and a hematocrit of 24% was present.

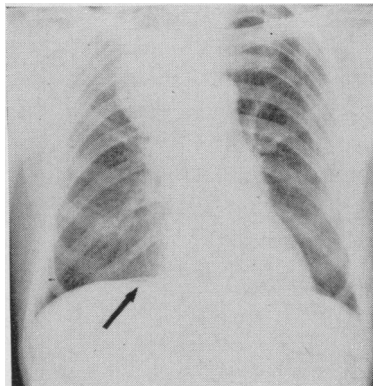


Fig. 2. (Case II) Plain film of the chest taken at six feet on September 13, 1961. The right upper lobe density is seen as in Fig. 1. The fluid level is not apparent on this film. Beneath the right leaf of the diaphragm (arrow) is seen free intraperitoneal air.

During transfusion of 1000 cc. of whole blood the patient was explored with a preoperative diagnosis of ruptured viscus.

On entering the abdomen a diffuse peritonitis was encountered with a large amount of purulent material in the pelvis and over the surface of the liver. Approximately 50 centimeters proximal to the ileocecal valve on the anti-mesenteric border of the ileum was a 1.2 cm. area of perforation. The serosal edges were rolled and granular and the mucosa was smooth and everted (Figs. 4 and 5). A segmental resection was performed with end-to-end anastomosis. A firm pale nodule in the right lobe of the liver was also biopsied. The subdiaphragmatic spaces and pelvis were drained externally. Pathology report revealed metastatic squamous cell carcinoma to the liver and ileum with perforation of the latter. Fig. 6 represents a photomicrograph of the lesion in the ileum at the site of perforation.

Post-operatively, the patient showed continued slow progressive deterioration with development of hypo-

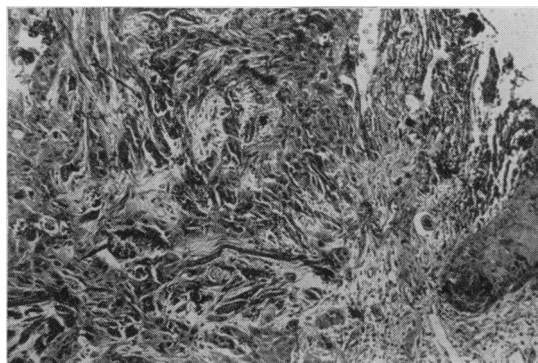


Fig. 3. (Case II) Photomicrograph of metastatic skin nodule on left shoulder (x157). "A" represents a rete peg of the epidermis. There is massive infiltration of squamous cells in the dermis. To the right of "B", large nests of tumor cells are seen.

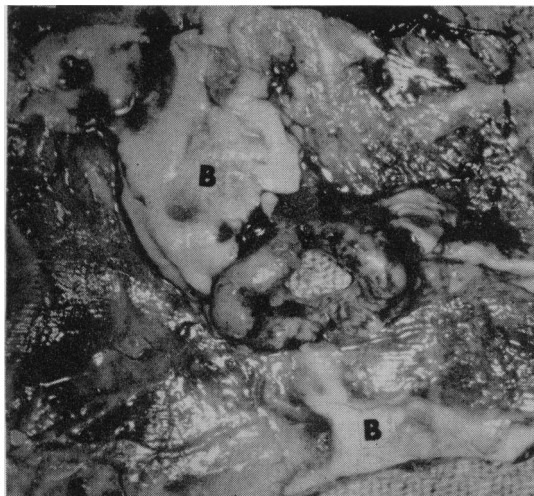


Fig. 4. (Case II) Rectangular segment of removed ileum after longitudinal incision along mesenteric border. View of serosal surface. Tumor with rolled edge is seen at A with central 1 cm. area of perforation. Fibrinous exudate is seen at B.

static pneumonia and demise on 9-30-61. Post mortem examination revealed a large 9 x 6 x 7 cm. neoplasm with a necrotic central cavity of debris and purulent fluid located medially in the upper lobe of the right lung. Pathological section revealed this to be a poorly differentiated squamous cell carcinoma. There were metastasis to both kidneys, the right and left lobes of the liver with hilar and para-aortic node involvement. No other implants were noted on the intestine.

COMMENT

Metastatic involvement of the small bowel is not an infrequent occurrence when it is secondary to abdominal carcinomatosis. If those cases in which spread by direct non-metastatic invasion are excluded the small bowel is found to rarely be the site of a single or multiple metastasis.^{13, 14, 15}

Willis,¹³ in a review of 500 cancer autopsies cited 27 cases of lung cancer. In only one was there intestinal metastasis. This one was located in the mucosa. No mention is made as to whether the involved intestine was large or small. In a later book he¹⁴ mentions 135 cases reviewed from the literature. In 102 of the cases there were only 65 in which the small bowel was alone involved. Of these, solitary metastasis to the intestine was recorded in only 18. Perforation was found in only one case of the small bowel metastasis and this primary was a renal cell carcinoma. DeCastro¹⁵ reviewed 26 cases of solitary or multiple metastasis selectively affecting the small bowel covering a span of 50 years at the Mayo Clinic. None of the

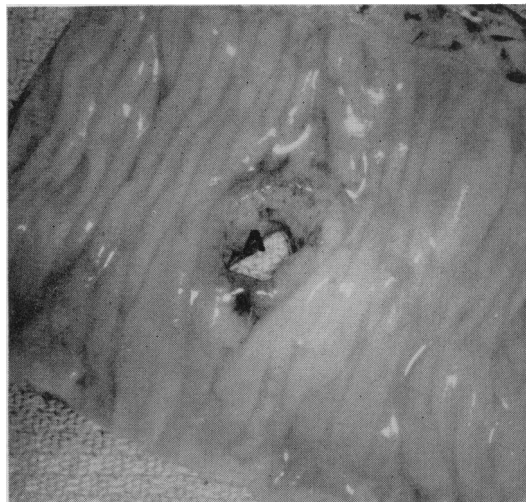


Fig. 5. (Case II) Mucosal aspect of segment of ileum seen in Fig. 3. Perforation is seen at A.

primaries were in the thorax. Seven of the 26 cases had pathological findings of perforation. Histologically, there were 11 squamous cell carcinomas and one each from the cervix and ovary were perforating.

In this case we feel the chronology of symptoms gives much credence to the lung as being the primary site. The pulmonary symptoms antedated the skin lesion by at least two and one half months and the intestinal perforation by three and one half

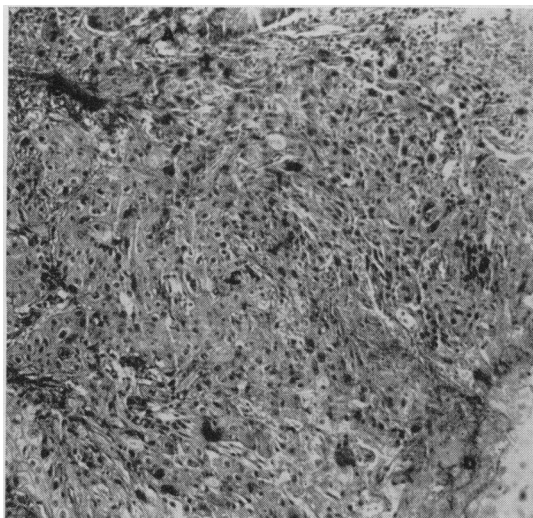


Fig. 6. (Case II) Photomicrograph of ileum showing area of perforation (x157). A remnant of mucosa with crypts of Leiberkuhn is seen at "A". "B" shows muscularis mucosa. There is extensive invasion of neoplastic squamous cells (C). The edge of the perforation is seen at "D".

months. Lung metastasis have been known to disseminate widely leaving few organs exempt. The more common sites in decreasing frequency are regional lymphnodes, liver, pleura, lungs, bone, adrenals, kidneys, brain and the heart and pericardium.¹⁶

The skin is frequently involved from lung metastasis. Ochsner and DeBakey¹⁶ in a review of 3,047 cases of metastasis from the lung found the skin and subcutaneous tissues involved in 3.6 per cent. Willis¹⁷ suggested that skin metastasis may cause early symptoms and difficult diagnosis. Skin lesions may be intra- or subcutaneous and are usually small and shotty, being less than 2 cm. and commonly distributed over the front and back of the chest and shoulders and abdominal wall near the umbilicus.¹⁸ Maxwell and Nicholson¹⁸ in reviewing 100 cases found an 8 per cent skin metastasis and point out that the lung as a primary should be considered when there is evidence of a metastatic subcutaneous or skin nodule found. In the above case it added support to the clinical findings which prior to autopsy had not revealed the histology of the lung lesion.

This patient presented a difficult problem in management. The clinically occluded bronchus with progression of the abscess and septicemia made the patient a poor operative risk under any circumstances. We do not feel that the interim successful removal of the metastatic nodule on the left shoulder hastened his demise any more than the non-productive bronchoscopies and scalene node biopsy may have done in any case. The addition of signs of a spontaneously perforated viscus certainly compounded his problem. The delay of more than 24 hours probably played a secondary but nevertheless important role in the demise of this patient. The findings of liver metastasis indicated that in spite of the previous clinical impression the disease was incurable. The liver need not be involved when bowel metastasis are present from the lung. In the cases reviewed by Willis¹⁴ 50 per cent of the patients were surprisingly free of metastasis.

A recent survey in our institution by Ricketts, Strudwick and White¹⁹ has shown a low survival rate of 11.1 months after onset of symptoms in untreated lung carcinoma. The longest survival of a patient with perforation of the small intestine due to metastatic carcinoma, as reported by De

Castro, et al.,¹⁵ was five months. Certainly this patient's prognosis of survival was poor with the combination of two lethal insults superimposed. Some may feel that he was the victim of a prolonged conservative attempt at diagnosis and control of the sepsis from the lung abscess. It is highly unlikely in this case that his demise would have been significantly delayed by an earlier operative approach.

SUMMARY

Two cases of spontaneous rupture of the small bowel in adults have been presented. These cases were encountered by the authors within the past two years. One case is recorded of a ruptured jejunum of undetermined etiology. This is of rare occurrence. This patient is well at present though convalescing from a left frontal abscess. The significance of the relationship between the two illnesses is not apparent.

The other case, a perforated ileum, secondary to a metastasis from the lung is recorded. This patient died on the 16th post operative day. Autopsy supported the clinical impression. This represents the only case recorded in which an antemortem diagnosis was made.

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**I WANT TO DIE WHILE YOU
LOVE ME**

I want to die while you love me,
While yet you hold me fair,
While laughter lies upon my lips
And lights are in my hair.

I want to die while you love me
I could not bear to see,
The glory of this perfect day,
Grow dim—or cease to be.

I want to die while you love me
Oh! who would care to live
'Til love has nothing more to ask,
And nothing more to give.

I want to die while you love me,
And bear to that still bed
Your kisses, turbulent, unspent,
To warm me when I'm dead.

Georgia Douglas Johnson