“Flatus Profuse Present in the Muscles”:
Subcutaneous Emphysema of the Lower Abdominal Wall and Thighs, Described in 1593 by Fabricius Hildanus

Erwin J.O. Kompanje and Ben van der Hoven

Abstract

Background: Between 1598 and 1641, 600 medical and surgical observations made by the famous German surgeon Guilhelmius Fabricius Hildanus (1560–1634) were published in his Observationum et curationum chirurgicarum centuriae I–VI.

Methods: Review of the extant document for evidence of infection-related cases.

Results: One of the case reports, published as Observatio LXX in the fifth Centuria, bears the title (in translation) Of flatus, profuse present in the muscles. This case report probably is the earliest accurate description of subcutaneous emphysema of the lower abdomen and thighs secondary to a retroperitoneal abscess.

Conclusion: The presence of gas in the superficial tissues of the abdominal wall or thighs is a rare feature and can be a late sign of an otherwise-obscure intra-abdominal abscess with gas-producing bacteria. Fabricius Hildanus almost certainly was the first to document this rare feature in 1593, and judged it important enough to describe in his Centuriae.

The presence of gas in the superficial tissues of the abdominal wall or thighs is a rare feature. Intra-abdominal disease can cause subcutaneous emphysema, and it usually is associated with perforation of the gastrointestinal tract, most often the rectum [1–11]. It also can point to a local gas-producing clostridial or non-clostridial infection [12]. Several authors have described retroperitoneal infections as a source of subcutaneous gas in the lower abdomen and thighs, which also can be a sign of an unsuspected intra-abdominal, retroperitoneal, or scrotal abscess [10,13–24].

Between 1598 and 1641, 600 medical and surgical observations made by the famous German surgeon Guilhelmius Fabricius Hildanus (1560–1634) (Fig. 1) were published in his Observationum et curationum chirurgicarum centuriae I–VI [31]. Each of the observations is illustrated by one or more case histories and some by woodcuts. The natural history of the condition and the invented treatment are discussed.

One of the case reports, published as Observatio LXX in the fifth Centuria, bears the title (in translation) Of flatus, profuse present in the muscles. This case report probably is the earliest accurate observation of subcutaneous emphysema of the lower abdomen and thighs attributable to a retroperitoneal abscess.

Case Report

Here is an English translation of the most essential part of this case report:

In the year 1593, in Keulen, I was sent for a boy of about ten years old, who has suffered heavily from smallpox, of which he was almost cured, but now his belly, down from the umbilicus, and his hips and thighs were peculiarly extended with flatus, which was present between the skin and the muscles, and partly in the muscles, and when these parts were touched with our hands, they rustled, just as fresh calf’s meat, that the butcher has inflated with air. He felt no pain, his internal parts were comfortable, and with almost no effects of the previous illness. We used several means, internally, to strengthen the noble internal organs, and externally, to make the flatus disappear, which ultimately resulted in a favourable outcome. If this excess in flatus penetrated the muscles from the stomach or intestines, or developed locally, I will leave that judgment to the experts.

Discussion

Hildanus gives an accurate description of abdominal wall crepitus attributable to subcutaneous gas in a ten-year-old
boy recovering from a severe case of smallpox. In the 16th Century, only variola major, the serious form of smallpox, occurred.

One can only speculate what caused this subcutaneous emphysema. Variola major was a serious infectious disease in the 17th Century, in many cases affecting several organs, including the intestines [25–27]. The virus can destroy the lining of the intestines, making the membranes disintegrate. The palpation of crepitus caused by gas in the subcutaneous tissue of the lower abdominal wall and thighs can be a late sign of an otherwise-obscure intra-abdominal abscess caused by gas-producing bacteria [7]. This seems to be the cause of the subcutaneous emphysema in this boy. Bacterial infections resulting in abscesses were common in the 16th Century, especially as complications after viral infections and in children with lower resistance [25–27]. Possibly the boy had a perforation of the gastrointestinal tract affected by smallpox or a secondary infection, resulting in a retroperitoneal abscess.
with gas-forming non-clostridial bacteria. The gas gains access to the lower extremity under the inguinal ligament or via the sciatic foramen [13]. The boy did not complain about abdominal pain, but signs of peritoneal irritation are uncommon [13]. Another consideration is that the boy was suffering from diabetes mellitus type I with a gram-negative infection leading to crepitant cellulitis [13,15,28].

Several authors mentioned that Abeille [28] described the first case of subcutaneous emphysema arising from the gastrointestinal tract in 1853 [8,23,30]. Regardless of the etiologic mechanism, Fabricius Hildanus almost certainly recognized in 1593 the first documented case of this rare feature, and judged it important enough to describe in his *Centuriae*.

**Author Disclosure Statement**

No conflicting financial interests exist.

**References**


Address correspondence to:
Dr. Erwin J.O. Kompanje
Department of Intensive Care
Erasmus MC University Medical Center Rotterdam
P.O. Box 2040
3000 CA Rotterdam, The Netherlands
E-mail: e.j.o.kompanje@erasmusmc.nl