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The challenge of bronchorrhea in advanced cancer — a case report with review of literature

Abstract

Excessive sputum production which exceeds 100 ml per day is called bronchorrhoea. It is a frequent symptom of adenocarcinomas of the lung. Especially the bronchoalveolar cancer is notorious for bronchorrhoea. We present here a case of a patients with copious bronchial excretions and discuss his treatment. There are many possibilities of treatment and they need to be looked at individually. Treatment of infection, bronchodilatation and prednislone are important, but in this case the best result was obtained from the treatment with continuous subcutaneous infusion of octreotide.

Key words: adenocarcinoma, sputum production, bronchorrhoea, somatostatin analogs, octreotide

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Introduction

Excessive sputum production is called bronchorrhea when it exceeds 100 ml per day. Such a situation can result from chronic inflammation [1], infection [2] or a bronchial tumour [3]. Notorious is the bronchoalveolair cancer where the volume of sputum was once reported to exceed 9 litres per day [4]. Primary, lung adenocarcinomas, but also metastases from elsewhere may also produce substantial sputum volumes [5–7]. It is not a surprising that bringing up such a volume of sputum may be difficult and result in many symptoms like chest infection, breathlessness, anxiety, depression and exhaustion.

Case description

A 66-years-old man was diagnosed with lung adenocarcinoma two years previously. He was rela-

tively well until metastases of this tumour were diagnosed in brain, liver and bones. Half a year before admission he lost his voice, probably because of mediastinal lymph node enlargement. For many months he produced large volumes of sputum, but after he lost his voice this became much more difficult. He was admitted to the hospice because of a chest infection, breathlessness, extreme anxiety and inability to bring up the sputum. The colour and smell of the sputum was changed in the last week and the patient experienced hyperthermia 38.2°C. In the last weeks before admission he also developed painful sacral sore and needed increasing doses of opioids to control his pain. He was not able to change his position and was forced lie supine in bed. He was started by his GP on Clarithromycin. On admission he was poorly. He expectorated several hundred ml of dark yellow-green, faecal smelling sputum. He was anxious and breathless. His oxygen saturation was down to 82%. He still had a

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lot of sacral pain despite a fentanyl patch of 25 mcg/h and oral morphine up to 80 mg/day in divided doses. He was swapped to buprenorphine patches 10 µg/h with the possibility of using oral morphine as before. His sacrum sore was treated with low level laser (Omega Laser, 46 cluster probe, 2 min, 9 J/cm², 156 KHz). His antibiotics were changed to Ciprofloxacin and later Augmentin. He nebulized saline solutions several times a day. A real change of the volume of sputum was observed after introduction of octreotide 300 µg/24h via a Syringe Driver. With this medication his symptoms were well under control while he continued to deteriorate. His lungs were nearly dry 5 days after admission. He died peacefully a week later probably because of pneumonia.

Discussion

Adenocarcinoma's may produce considerable volumes of mucus as the malignant transformation affects precisely the cells responsible for mucus synthesis and excretion. In our patient copious sputum resulted not only from the tumour but also from his inability to expectorate. Paralysis of the laryngeal recurrent nerve made it impossible for him to close his vocal cords properly and to build enough pressure to expectorate. Pain at the sacrum, necessitating use of opioids, further reduced his cough reflex [8]. All three factors resulted in sputum retention and sputum infection. Clarithromycin was changed to Ciprofloxacin and Augmentin was added later when the results of the sputum culture (*E. coli*) were known. Treatment of the sacral sore with LLLT resulted in rapid pain control and wound improvement and improvement of the wound [9]. This allowed the patient to rely on the low dose buprenorphine patch only and he did not need the extra doses of oral morphine.

Information recovered from the literature on bronchorrhea was discussed with our multidisciplinary team. Palliative radiotherapy [10] which could result in less sputum production was rejected as too burdensome as the patient was too poorly to be transported to the hospital. Anticholinergics like hyoscine butylbromide were repeatedly found ineffective in similar cases while they increased xerostomy [11]. Copious secretions respond to high doses of methylprednisolone IV [12] or indomethacin inhalation [13, 14]. We did not have enough experience with these treatments. Another suggestion was to prescribe macrolides which sometimes work [15, 16], not as antibiotics, but as specific inhibitors of

synthesis of mucine proteins. This treatment was rejected on the grounds that our patient had been treated with clarithromycin for 6 days already, without much success. Recently a very rapid and specific effect on bronchorrhea in bronchoalveolar cancer was described with gisetinib, an inhibitor of epithelial growth factor [17–20]. This drug is strictly rationed in the UK and is not available for patients like ours. On the other hand we did not find it appropriate to treat our patient with a chemotherapeutic agent because of its toxicity. We chose to treat with octreotide which is readily available on the palliative care unit [21]. We have found the drug effective and it has been well tolerated by even very ill patients. Octreotide inhibits secretine, responsible for the shift of electrolytes across the membranes [22, 23]. In this way octreotide may inhibit production of the copious sputum. According to the patient's own words; "the effect was already evident after a couple of hours". We accepted that improvement of airway clearance is very difficult in cases of vocal cord malfunction. So the aim of our treatment was not to treat the inevitable pneumonia, but to control his symptoms and especially anxiety. This target was achieved, while his general condition continued to deteriorate. We feel that it was important to diminish iatrogenic effects of opioids on his cough reflex through maximising of non-opioid methods of pain control. In our hospice we often use the LLLT and results are sometimes striking. Here we achieved good pain control within 24 hours and visible improvement of the skin within three days. Buprenorphin was chosen because of ease of application and because of its lower antitussive potential in comparison to fentanyl and morphine [24].

Symptom control has had another important effect on the patient. It lowered his anxiety levels and reduced his fear of death. It allowed him and his wife to communicate better about the future and adjust their expectations to reality.

Conclusion

In a patient with bronchorrhea which persisted after the treatment with antibiotics we used octreotide to diminish sputum production. Octreotide administered in usual dose had a profound effect on the volume of the sputum. However, this patient was not able to cough up well because of recurrent nerve paresis. Although his symptoms were well controlled he died peacefully because of pneumonia.

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