Penicillin in Acute Suppurations of the Lung

DONATO G. ALARCON, M.D., F.C.C.P.
Mexico City, Mexico

Acute suppurations of the lung have been always one of the hardest problems which the specialist is called to confront due to the peculiar circumstances of the condition.

Drainage of the abscesses through the bronchus, when its patency is maintained, has been the hope for a spontaneous healing in all cases and in this expectancy, several weeks and months usually elapsed thus delaying surgical intervention which is always feared as very hazardous.

The use of some measures such as postural drainage, intravenous injections of several substances as sodium benzoate, ethyl alcohol, creosote derivatives, vaccination, arsenical compounds, etc., were considered justified until recently and a number of healings were attributed to every one of the procedures tried, although most of these measures could not resist the test of a critical study. Most probably the good results of some drugs should be credited to spontaneous healing through bronchial drainage.

When the group of sulfa drugs appeared, renewed hopes led to the trial of these drugs in pulmonary abscesses and after some experience was gathered the consensus of the specialists was not entirely favorable and the surgical approach, which calls for the artificial drainage of every purulent collection, held its position. Therefore, a large number of suppurations were surgically treated once reasonable time had been given to test the effectiveness of the sulfa drugs.

With the advent of penicillin, again all of us started trying the new drug for these suppurations, with the hope of avoiding surgical treatment and its risks. The early experience with penicillin, however, was not very satisfactory, for those who reported the first results from the use of the drug according to the pattern employed for other diseases.

Again, the principle of draining any collections of pus was holding its position and most of the early observers advised not to delay the operation. Particularly, there were reported failures when dealing with abscesses caused by anaerobic germs of the fetid type. Little hope was left for the use of penicillin in this

Presented at the Twelfth Annual Meeting, American College of Chest Physicians, San Francisco, California, June 27, 1946.
group of suppurations in which nevertheless no one failed to employ penicillin, more or less skeptically.

This condensed communication deals with the shortest description of a small series of lung abscesses treated with penicillin since this drug has been available. It is noteworthy at once that the number of cases coming to the specialist since the advent of penicillin is much less numerous than used to be, and this seems to indicate that the popular use of the drug has diminished the incidence of pulmonary suppurations in a very large degree.

The other point which I intend to stress is that since penicillin has been available, very few acute lung abscesses have reached the surgical stage, as most of them resolve before surgery is imperative. I may state that among the last ten cases seen by the writer in the last two years, only one was operated on account of pleural complication of the abscess and none has undergone the usual thoracotomy. This situation is strikingly different from that of a few years ago, when about fifty per cent of the lung abscesses needed surgical treatment, around the second month.

Due to the short time allotted to this presentation, I will make a brief description of eight cases. At the end, I shall try to draw some suggestions for the treatment of these suppurations from this experience which being limited as yet, force us to adopt a different attitude toward these conditions, than we did years ago.

CASE REPORTS

The first case is that of a boy who developed a lung abscess and pneumococcus empyema in April 1944, and was seen as illustrated in Figure 1. The blood picture was characteristic: Leucocytes: 23,300, neutrophiles 82 per cent; typical fever; sputum: pneumococcus and no tubercle bacilli.

He was treated with sulfapyridine and sulfamerazine but did not improve and before I saw him, 900,000 units of penicillin were given intramuscularly during a week. Then, I suggested the use of local instillation of penicillin into the cavity through the bronchoscope. It was done and spectacular success was obtained immediately. The fever subsided at once, the leucocytes diminished in number in less than a week and the cavity decreased as is seen in Figures 2, 3 and 4.

In this case we did not doubt that the success was due to the bronchoscopic use of penicillin although we did not give the procedure full credit because it was the first one.

The second case was that of a lady, 45 years of age, suffering from a definite suppuration of the lung of the fetid type. The sputum was abundant and very foul, the condition very critical, leucocytes over 20,000, and the x-ray film showed a large cavity (Figure 5).

The patient demanded very eagerly to be operated on, because she was coughing continually. Penicillin had been used by her doctor in rather large amounts intramuscularly, for over a week, and no signs of improvement were noticed. Rather, she seemed to become worse every day. However, I suggested the bronchoscopic application of penicillin, though 1
remained ready to operate in the next days. The improvement was extremely gratifying. In a few weeks she became well, as can be seen in Figures 6 and 7.

The third case is that of a man of 35 who was under treatment on account of some erroneous diagnosis of typhoid fever and later discovered to suffer from empyema (Figure 8). Pneumococcus, streptococcus and fusospirrochetal organisms were found in the pus of the empyema. A catheter was introduced without allowing air to enter; then the pleural cavity was washed and penicillin was left in the pleural space at short intervals. Also, penicillin was used intramuscularly. When he improved
and became ambulatory and penicillin was discontinued, he developed a lung abscess, as may be seen in Figure 9. The condition became very serious. Bronchoscopy was done and penicillin instilled into the right bronchus, and an immediate improvement was seen. A few instillations
into the trachea after the bronchoscopy were done and he recovered completely (Figure 10).

The fourth case is of a man, aged 46 years, who had some respiratory condition seemingly benign at first but his physicians became alarmed when he developed dyspnœa and had foul expectoration. The x-ray film showed a round infiltration, and although the condition was admittedly serious, was treated with sulfadiazine (Figure 11). In a few days he became rapidly worse and suddenly developed severe dyspnoea, cyanosis, high temperature and tachycardia. Then a new film was taken and a pyopneumothorax was diagnosed. The pus obtained by tapping was very
fetid, and contained staphylococcus, streptococcus, fusospirochetal organisms and several other germs not identified (Figures 12 and 13).

The patient was operated upon in a very critical condition; a pleurotomy was performed, leaving a couple of tubes high on the back because the lung was adherent at the lower lobe. The film shows the approach and the result of the drainage (Figure 14).

Before the operation, the patient had several vomicas and during the operation, the opening of the bronchus into the pleura was confirmed. Through the tubes, penicillin was injected three times a day and a striking improvement was seen. In about ten days, the closing of the bronchial fistula was noticed and large washings of the pleural cavity
were feasible, leaving at the end of the washings, some penicillin solution. After about 40 days, he left the hospital and has been well for over a year thereafter.

The fifth case, that of a man of 75 years of age, is worthy of description: He was at a hospital, unconscious for a week, under treatment with penicillin in regular doses, and with the diagnosis of lung abscess already established. Figure 15 shows the Roentgen ray aspects. Bronchoscopy was suggested with leaving penicillin in the cavity, if possible. This was done twice without discontinuing the intramuscular injections. Within a week he recovered consciousness and improved in an unex-
pected way. He became completely well in 40 days and resumed his normal life (Figure 16).

Three more cases can be summarized as follows:

One is that of a man 65 years old, with a definite suppuration of the lung clinically, bacteriologically and roentgenologically.

Figure 17 shows his condition. He improved under the treatment described but relapsed soon to improve twice more under the same treatment. On account of this circumstance, carcinoma of the lung was suspected and puncture-biopsy done which confirmed the diagnosis. He died after a pulmonary hemorrhage (Figures 18 and 19).
The seventh case is one of lung abscess following a duodenal operation. He was under penicillin treatment given intramuscularly, one million units already having been administered. I advised to proceed with treatment outlined above and he healed completely after four weeks (Figures 20 and 21).

The last case is one of acute suppuration with atelectasis, leucocytosis of 19,000, fever, anemia and other toxic and local symptoms. Another specialist did bronchoscopy and diagnosed carcinoma, although the biopsy was negative (Figure 22). Treated with penicillin for over one month. The shadows seen on the first film disappeared and the patient recovered completely (Figure 23).

From this short series of cases we shall try to draw some suggestions concerning the treatment of pulmonary suppurations by means of penicillin.

1. The use of penicillin should be continued for as long as necessary to obtain a definite improvement clinically as well as hematologically. This protracted use of penicillin must go beyond the average for other acute diseases before it is considered a failure.

2. The improvement as ascertained by Roentgen rays is much less rapid than the clinical and hematological ones. Under penicillin treatment the cavities become sterile, we believe, before they close, as far as the combined clinical, hematological and x-ray films can show.

3. When an immediate response to the intramuscular penicillin is not seen, the use of the bronchoscopic approach to the purulent focus is imperative.

4. In these cases, as described, credit should not be given to bronchoscopy alone but to the combined use of penicillin intramuscularly and bronchoscopically. Earlier experience with the bronchoscope alone failed to give as good results as the combination of these two methods.

RESUMEN

La evacuación del contenido de los abscesos pulmonares ha sido el mecanismo natural que tiende hacia la curación del proceso supurante. Esta evacuación espontánea y constante a través de un bronquio permeable no es sin embargo el hecho corriente en la evolución de los abscesos pulmonares y el esperar que la canalización espontánea conduzca a la curación es a menudo peligroso.

El empleo de medios médicos como las drogas diversas, vacunación, o de medios mecánicos auxiliares como la canalización postural se consideraban justificados en la espera previa a cualquiera determinación quirúrgica y a esos medios se atribuía a menudo el éxito satisfactorio que más bien se debía a la tendencia espontánea a la curación.

Aún al aparecer las Sulfonamidas se obtuvo un número de cura-
clones atribuibles a su uso, muy bajo en relación con lo que se esperaba.

La Penicilina hizo a su vez esperar mejores resultados, pero se empezaron a referir resultados poco convincentes sobre todo tratándose de las supuraciones de anaerobios.

Es interesante notar que desde que la Penicilina se ha popularizado el número de abscesos que llegan al especialista se ha reducido de modo considerable, lo que debe atribuirse a que esas supuraciones son tratadas con precocidad y de hecho son dominadas antes de llegar a la etapa abscedal.

Antes del advenimiento de la Penicilina, cuando menos la mitad de los casos de absceso-pulmonar tenían que ser operados por los medios habituales en la etapa subaguda.

Hoy es excepcional la intervención de ese género.

Se presentan ocho casos de absceso pulmonar tratados por la Penicilina, en los que se pusieron en juego los recursos habituales antes de instituir el tratamiento por ese antibiótico.

Se usaron las sulfonamidas al principio. Sobre todo por la escasez de Penicilina, se usó ésta por vía intramuscular y en todos los casos salvo uno, se recurrió a la aplicación de la droga por medio del broncoscopio una o varias veces, depositando la solución dentro del absceso y obteniéndose a partir de esa aplicación una definida mejora, que en la mayoría no se había logrado por el uso de la Penicilina sola por vía intramuscular a dosis suficientes.

El único caso en que no se obtuvo resultado favorable de este procedimiento, fue el de un cáncer supurado, comprobado por punción-biopsia.

Las conclusiones a que llega el autor:

1. El uso de la Penicilina en las supuraciones pulmonares debe ser tan prolongado como sea necesario para obtener la mejoría radiológica, clínica y hematológica de manera definida. Esta prolongación del uso de la Penicilina debe llegar mucho más lejos de lo aconsejado en otras enfermedades agudas antes de declarar su ineficacia.

2. La mejoría que puede verse a los rayos X es mucho menos rápida que la clínica y la hematológica. Bajo tratamiento con Penicilina creemos que las cavidades se esterilizan relativamente antes de ser clausuradas anatómicamente.

3. Cuando no se obtiene una respuesta favorable inmediata al uso, de la Penicilina intramuscular, debe emplearse la aplicación de Penicilina in situ por el broncoscopio.

4. No puede atribuirse sólo al uso del broncoscopio la mejoria notada en esta pequeña serie de casos, porque la experiencia anterior no demuestra una constancia de resultados favorables por uso solo, como la aquí referida.