

this country home. This would solve the question of fresh air. Of course, he said, one can feed these children most scientifically, care for them most carefully, have a nurse for each three or four children and 1,000 cubic feet of air space to each child, and still they will not thrive. But get these same children out of doors and they will pick up at once. The asylum in which Dr. Walker is interested has a home in the country, which is used six months of the year, and the difference in the children out in the country and in the city is remarkable. He believes, therefore, that to carry out the plan of using the city quarters for receiving the children, and the country quarters as their more permanent home, will be more conducive to success. Very important to add is the fact that the care of children in the country is cheaper than caring for the same number of children in the city.

DR. C. G. KERLEY, New York City, said that while he believes ventilation, air space, attendants, feeding, etc., are of importance, it has been impressed on him that of more value than any other one thing is the thorough emptying of the ward, if possible, in the daytime. There should be a separate place for the children during the day and a special sleeping place at night, just as in private life. The mortality depreciates remarkably. It requires more space, a roof garden, and, perhaps, one entire floor during the remainder of the year. If the children have separate rooms day and night the results are much more satisfactory. After twenty years' work among these children this seems to him the most important feature.

DR. J. RUHRÄH, Baltimore, called attention to the fact that it is very much easier to feed a child well taken care of than one not well taken care of.

ADENOIDS IN INFANCY.*

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While the frequency and importance of adenoids in childhood is well recognized and their symptomatology pretty generally understood, this is not the case as regards adenoids in infancy. These are supposed to be uncommon and of little importance, and their symptoms are commonly overlooked or misinterpreted. They are, however, very common in infancy and of the greatest importance. Their symptomatology, while in many ways different from that in childhood, is, nevertheless, fairly characteristic, and the evil results produced are even greater in infancy than in childhood. Although this is undoubtedly true, there is, nevertheless, a general feeling in the profession, even among the throat specialists, that adenoids should not be removed in infancy, the reason given being that they are liable to recur later. It is true that they may, and sometimes do, recur later. The fact is, however, that in the majority of cases the adenoids do not recur, but even if they do and a second operation is required, the infant is spared in the meantime all the inconveniences and dangers of adenoids and the evil results which they produce. The removal of adenoids in infancy is a comparatively simple operation and practically devoid of danger. The removal of adenoids in childhood is hardly more difficult and is not attended by any greater danger. The dangers of either a primary or a secondary operation can not, therefore, be taken into account. Certainly there is no danger connected with either operation which should be considered for an instant in comparison with the evil and even dangerous results which adenoids may, and

often do, produce in infancy. There is, therefore, no sufficient reason for delaying the operation and no justification for allowing babies unfortunate enough to be afflicted with adenoids to have their development seriously or irreparably interfered with, to be subjected to all the evils which adenoids produce and even to die, as sometimes happens, when these unfortunate results may be avoided by an early operation.

Before taking up the symptomatology of adenoids in infancy it may be well to review the anatomy of the nasopharynx and its adnexa at this age. The nasopharynx is very low at birth, but is relatively long from before backward, the distance from the back of the hard palate to the soft parts of the back of the pharynx being nearly as great at birth as in the adult. The nasopharynx at birth is, therefore, merely a narrow passage running obliquely backward and downward from the constricted opening of the posterior nares. The soft palate is placed more horizontally than in the adult. The height of the nasopharynx increases with that of the posterior nares.

The nose is relatively small and the respiratory portion very small. The height of the posterior nares at birth is from 6 to 7 mm. and the breadth between the pterygoid processes at the hard palate 9 mm. The nasal cavity consists of an upper olfactory region, occupying the ethmoidal portion of the cavity, and a lower respiratory portion occupying the maxillary part. The nasal cavity is relatively long and shallow at birth and the respiratory portion is very narrow. The whole opening of the posterior nares on either side is just large enough to admit the end of a medium-sized male catheter. The nasal cavity begins to increase in height directly after birth, increasing rather rapidly during the first six months, but very slowly during the rest of infancy. The size of the posterior opening doubles in six months, after which it remains stationary until the end of the second year. At the end of the seventh month the nasal cavity begins to approach the adult shape, though it is still relatively broad.

The Eustachian tube is nearly horizontal at birth, but slants a little during the latter part of infancy. The opening at birth is at the level of the hard palate. It remains at this level for nine months, but later becomes distinctly higher. The tube is not only relatively, but absolutely, wider at its narrowest point at birth and during infancy than in the adult.

The nasopharynx is extremely vascular and there is an abundant supply of lymph glands and vessels, especially in the posterior wall. The lymphoid ring is well developed at birth, often more so during infancy.

On account of the small size of the superior pharynx and postnasal opening, even a small amount of adenoids may cause marked obstruction to nasal respiration. In infancy this is a very serious matter, especially if it is anywhere nearly complete. Interference with nasal respiration necessitates oral respiration, which the young infant performs very imperfectly, especially when asleep. This interference with respiration results in the constant deprivation of a sufficient supply of oxygen, which, in turn, produces a disturbance of nutrition which is uninfluenced by any method of feeding or mode of life. Another serious result of the nasal obstruction is the interference with sucking and sometimes with swallowing. The effort of sucking is so great that these babies take only enough food to satisfy the acute pangs of hunger. Lack of food, therefore, also interferes with their nutrition and development. The difficulty in breathing

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makes them restless at night and interrupts their sleep, which again disturbs their nutrition. It is difficult to realize how much disturbance of nutrition adenoids may cause in infancy until the improvement in the general condition after their removal is seen. It is wonderful how quickly improvement begins and progresses. The following case illustrates these points most strikingly:

History.—A three months' old baby developed snuffles and soon after began to have a little difficulty in breathing, especially at night. He continued to take his food fairly well, but ceased to gain when four and one-half months old. In spite of his difficult respiration, he managed to sleep pretty well. His head began to sweat freely when he was four and one-half months old, and a week or two later his mother noticed that his head was "soft." At about the same time he began to have frequent attacks of laryngismus stridulus, especially when taking his bottle. Two weeks later, he began to have convulsions.

Examination.—I saw him when he was six months old. He was in poor general condition. He kept his mouth open and but little air passed through the nose. There was marked craniotabes and a moderate rosary. The throat was normal to inspection, but adenoids were felt with the finger.

Treatment and Result.—The adenoids were removed a few days later. Improvement was almost immediate and there were no more convulsions or attacks of laryngismus. He began to take his food well and soon began to gain in weight. Two months later he was in splendid condition, the head solid, the color good, the mouth shut and the breathing quiet.

Rickets is very likely to develop in these cases of disturbed nutrition from adenoids. Deformities of the chest are not uncommon as the result of the interference with the entrance of air, the soft rachitic bones yielding in various ways to atmospheric pressure and the pull of the muscles. The most common deformity is retraction at the insertion of the diaphragm. Pigeon breast is also common and retraction of the sternum not unusual.

Adenoids will almost always be found in those babies who are subject to frequent "colds in the head" and are undoubtedly most important in their etiology. In fact, repeated "colds in the head" are rarely met in infancy when there are no adenoids. The infants continue to have "colds," moreover, in spite of local or general treatment until the adenoids are removed. A "cold in the head" in infancy is not the simple thing that it is in older children and in adults. It is often a serious matter and in some cases may even prove fatal. It hardly seems worth while, however, to report specific instances in which babies who had had repeated "colds" have been completely relieved by the removal of the adenoids, as there is nothing to report except the bare facts.

Adenoids are also one of the commonest, if not the most common, cause of chronic "snuffles" in infancy. They are usually overlooked in this connection, however, because the baby does not keep its mouth open, snore at night or have the typical facies of adenoids in later childhood, there being apparently a general impression that there can be no adenoids, at any rate no adenoids of importance, unless these symptoms are present. In infancy, however, chronic "snuffles" is almost as suggestive and characteristic of adenoids as these more marked symptoms are in childhood. In most cases the "snuffles" continue until the adenoids are removed. In some of the mild cases, however, operation is not necessary and local astringent and stimulating treatment gives good results. I use the following mixture:

R.	
Iodini	gr. $\frac{1}{4}$ - $\frac{1}{2}$
Camphoræ	
Menthol aa	gr. $\frac{1}{2}$ -1
Benzoinol	oz. 1
	30

016-032

032-06

From five to ten drops of this mixture are put into each side of the nose with a dropper every three or four hours, with the baby lying on its back so that they may run through into the nasopharynx. This is altogether the best way of making applications to the nose and nasopharynx in infancy, sprays being of little use at this age because of the fright and struggling which they induce.

The following cases are examples of "snuffles" due to adenoids in infancy:

A 3-months-old baby, which had always been breast-fed, had had "snuffles" with a little cough since he was 5 weeks old. He usually kept his mouth shut and was always able to nurse, but with a good deal of snuffling. The diagnosis of bronchitis was made by several physicians. He was a very large, healthy-looking baby, constantly snuffling. All the organs were normal. The throat and nose were normal to inspection. A small amount of adenoids was felt with the finger.

A girl, 7 months old, had had "snuffles" with frequent exacerbations for about three months. Examination was entirely negative except that a small amount of adenoids was palpable. Their removal was followed by immediate and permanent relief of the symptoms.

Adenoids not only cause "snuffles" and "colds" in infancy but also very frequently an irritating cough without physical signs. This cough is especially troublesome at night. Treatment, unless the real source of the symptoms is recognized, is of no avail. Cough mixtures and throat sprays are useless and the cough can only be controlled by stupefying the infant with bromid or paregoric. Treatment of the adenoids or their removal is, however, almost immediately successful. The following case is an example:

A baby, 5½ months old, that had never gained very well and had taken her food poorly, began to have snuffles which were soon followed by a cough at night which kept her from sleeping. Her throat and lungs showed nothing abnormal. Nasal respiration was fairly free and the discharge from the nose was insignificant. A moderate amount of adenoids was felt by the finger. The adenoids were removed when she was 7 months old. The cough ceased after twenty-four hours and never recurred. Improvement in her general condition also began at once and continued.

Adenoids are also frequently accompanied by attacks of catarrhal laryngitis and spasmodic croup. They are presumably the cause of the laryngitis and croup because these cease immediately after removal of the adenoids. The following case is an example:

A girl, during her second winter, had three attacks of catarrhal laryngitis, in none of them, however, being very croupy. She also had a number of "colds in the head" during the same period. Treatment was most unsatisfactory. Removal of the adenoids was followed by a complete cessation of the "colds in the head" and attacks of croup.

Adenoids are also a very common cause of sleeplessness and restlessness at night in infancy, even when there are no marked symptoms like mouth-breathing, snuffles or cough. They should always be thought of when babies sleep poorly. The following case is an example:

An absolutely well baby, thriving in every way, began to sleep poorly both day and night when about 7 months old. The restlessness was at first attributed to teething, then to hot weather, then to noise about the house. It continued, however, into the winter, in a quiet house and after the teeth were through. All sorts of changes were made in his life without any effect on the sleeplessness. The general condition and digestion continued perfect. Finally, after six months, the adenoids were discovered and removed. Improvement was almost immediate and in a few weeks he was sleeping perfectly well both day and night. In this case there were no

other symptoms whatever of adenoids, no "snuffles," "colds in the head," mouth-breathing or snoring.

The development of adenoids opens the doors of the lymphoid ring of the pharynx still wider for the entrance of bacteria or their toxic products. They are, therefore, often accompanied by, and are undoubtedly frequently the cause of, enlargement of the cervical lymph nodes in infancy, enlargement of the cervical lymph nodes being frequently found in connection with adenoids in cases in which there is no enlargement of the tonsils or nasal or aural catarrh. Enlargement of the cervical lymph nodes in connection with adenoids is so common that it hardly seems worth while to cite cases. These nodes, moreover, are not infrequently tuberculous. Tuberculous infection of the adenoids themselves in infancy, while possible, is undoubtedly unusual. It is probable, however, that tubercle bacilli not infrequently pass through the adenoid tissue. This is shown by one of my cases in which, through a mistake in diagnosis, the adenoids were removed from an infant of 5 months during the early stage of tuberculous meningitis, tubercle bacilli being found in the adenoid tissue. The danger of tuberculous infection from adenoids is, therefore, a real one and furnishes another reason for their early removal.

On account of the anatomy of the pharynx and Eustachian tubes in infancy, adenoids, either directly or through the colds which they induce, are undoubtedly the most common cause of otitis media at this age. As already mentioned, the Eustachian tube is nearly horizontal and the opening is at or a little above the level of the hard palate. The tube is not only relatively but absolutely wider at its narrowest point during infancy than in the adult. These facts explain, in all probability, the ease with which catarrhal processes travel in infancy from the nasopharynx to the middle ear. Another explanation of the frequency of otitis media is the fact that an increase in the size of even a small amount of adenoids usually blocks the Eustachian tube, cutting off the circulation of air and predisposing to infection. In my experience repeated attacks of otitis media in infancy are almost invariably due to adenoids, and the attacks continue to recur until the adenoids are removed. The following case is an example of otitis media in infancy in connection with adenoids, with complete cessation of the attacks after the removal of the adenoids, although the child continued to have colds in the head from time to time:

This baby in her first winter, when 5 months old, had two attacks of acute inflammation of the middle-ear in connection with slight "colds." During the rest of the winter and the following summer there were no symptoms pointing to the ear or the nasopharynx. The following winter she had repeated "colds" and during the latter part of the winter five attacks of otitis media, one attack hardly being cured before another developed. The adenoids were removed in the early summer. There has been no recurrence of the otitis media in the three years since.

This is not the place to speak in detail of the symptomatology of otitis media in infancy. It must be remembered in this connection, however, that earache, tenderness over the mastoid and putting the hand to the ear are uncommon signs in the otitis media of infancy, while the common signs are restlessness, irritability and fever.

These cases illustrate in a general way some of the more common effects of adenoids in infancy and serve

to call attention to the variety and peculiarity of the symptomatology at this age. They also emphasize the importance and advantage of early operation.

DISCUSSION.

DR. G. L. RICHARDS, Fall River, Mass., said that some points brought out by Dr. Morse were not, until recently, recognized by the profession at large, nor by the laryngologists. First, the anatomic relation of the Eustachian tube and nasopharynx in the development of the child. The tube is very low in the young infant, and a small degree of adenoid trouble in such a child may create much disturbance. As to nasal breathing, if a child breathed through its nose it was supposed to eliminate adenoids. Many children, he said, have a sufficient amount of adenoids to produce considerable disturbance and still breathe through their nares. The other point, which Dr. Richards thought was, perhaps, the most important, is with reference to the ultimate result in reference to the child's hearing, otitis media and mastoid conditions. He saw a child with double mastoid, which, so far as he could determine, was due to adenoids in the nasopharynx. Yet the child breathed all the time through the nose. It is important, he said, to recognize that small amounts of lymphoid tissue in young infants should be considered immediately. Dr. Richards stated that there are two methods of examination which are satisfactory in a young child. One way is to have the child held firmly, in a good light, lift up the soft palate with a retractor, and the nasopharynx can be seen easily. The other method is to use the finger, but the finger should always be protected with a sterile rubber cot, because it is difficult to get the nares perfectly clean, and it is very easy to injure the mucous membrane with the finger nail. Dr. Richards does not regard the finger nail as a surgical instrument in any young child, although in the past the finger nail operation in a child was quite popular.

DR. S. J. WALKER, Chicago, agreed with Dr. Morse that the finding of adenoids in infants is rather unusual, and operation for them still more unusual. He has often made a diagnosis of adenoids in infants, but has never considered operation in very young infants. A laryngologist whom he consulted, a man who is thought of very well in Chicago, gave it as his opinion that it is a mistake to operate on any infant 10 or 12 months of age; therefore, he has not endeavored to do anything for such cases. However, in view of Dr. Morse's results, Dr. Walker thought that, perhaps, hereafter he will insist that the laryngologist operate in certain cases and note the results.

DR. T. W. KILMER, New York City, cited the case of a little boy, 3 months old, who was brought to the hospital because he could not nurse. He had all the symptoms Dr. Morse related. He was operated on at once, without an anesthetic, and almost immediately he had his first square meal. Dr. Kilmer advised making careful examination for symptoms of syphilis before operating on these cases of adenoids. He has seen these symptoms disappear under mercurial treatment. To remove the adenoids, he uses a uterine curette. Dr. Kilmer thinks that there is a tendency to overlook the fact that very young babies may have adenoids.

DR. J. L. MORSE, Boston, Mass., has found that nearly all laryngologists are unwilling to operate; they have to be driven to it. The reason given is that the adenoids will recur later. It is almost impossible, he said, to make them appreciate how much harm adenoids may do to a baby during these early months, and consequently how much harm can be avoided if the adenoids are removed. Consequently, he believes that even if the adenoids do recur it is no reason why these babies should not be operated on.

Early Diagnosis of Jaundice. — Posselt states in the *Centrbl. f. inn Med.*, p. 489, 1907, that even a trace of bile pigment in the blood can be detected by drawing a drop of blood into a U-shaped capillary, about 9 cm. long and 1 mm. lumen, warming the tube and then centrifugalizing. A canary yellow or lemon tint in the supernatant serum is an index of the presence and proportion of bile pigment in the blood.