CHRONIC INTERSTITIAL OTITIS, OR CHRONIC MIDDLE-EAR CATARRH AND OTOSCLEROSIS.*

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The object of this paper is to justify the author's opinion that a single fundamental pathological condition underlies the changes of the middle ear formerly classified under the two headings, chronic middle-ear catarrh and secondary otosclerosis. This condition, he thinks, is appropriately described by the term chronic interstitial otitis. It is the author's opinion that secondary otosclerosis, the type associated with middle-ear changes, is the result of the same interstitial inflammation which affects the connective tissue of the middle ear in chronic middle-ear catarrh. In secondary otosclerosis, however, the effects of the inflammation have invaded the underlying bone. The author also thinks that, clinically, even in the cases with hereditary history, otosclerosis is usually of the secondary type. He believes that the heredity is not a quality of the otosclerosis but that otosclerosis depends upon an hereditary defect of the system which predisposes to disturbed circulation of the mucoperiosteum and to otosclerotic changes.

Chronic interstitial otitis is a condition of the middle ear which commences with chronic congestion of the mucous membrane or mucoperiosteum. Sequent to this congestion occur round-celled infiltrations resulting in fibrosis of the membrane, contraction of the fibrous tissue and anemia consequent on the compression of the blood vessels. The congestive, infiltrative and fibrotic stages may, however, be omitted, leaving anemia to take the primary place in the cases formerly classified under *otitis media catarrhalis insidiosa*. Last of all, degenerative changes take place. The final changes caused by the anemia include atrophy, degeneration and calcification. The diminished blood supply in the bone underlying the affected mucoperiosteum brings about bone absorption, osteoporosis and hyperostosis. Although these changes in the bone have been described by many writers on the subject, there has been as yet no entirely satisfactory etiological explanation. The foundation for the author's explanation rests on (a) an histological analogy and (b) on his clinical experience.

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The histological analogy of the bone lesions of otosclerosis is found in the histological identity of these lesions with certain bone lesions occurring in later syphilis. The syphilitic bone changes are dependent on primary vascular changes in the periosteum which cause a diminished blood supply to the bone, followed in turn by absorption of the old bone and the growth of new bone. The author thinks that the bone changes of the labyrinth in secondary otosclerosis can be explained on the basis of antecedent mucoperiosteal anemia. Familiar facts are the vascular changes of the mucous membrane and mucoperiosteum of the middle ear and their results in infiltration, fibrosis, contraction, anemia, atrophy, and degeneration. The author thinks that these changes, occurring in the mucoperiosteum of the outer labyrinthine wall in predisposed individuals, cause bone changes within the osseous capsule identical with the changes caused by a similar alteration of the periosteal blood supply in other bones due to the syphilitic infection.

The clinical foundation for the author's etiological explanation of secondary otosclerosis is derived from a number of years' clinical experience with a large amount of material. This experience is exemplified in the following series of two hundred successive cases of chronic interstitial otitis.

This series of cases has been almost entirely treated on the basis of disturbed circulation. Improvement in hearing is shown in the otosclerotic class as well as in the cases of chronic middle-ear catarrh. All cases with acute symptoms were carefully excluded from this series, and every case that had any sign or history of aural suppuration was rejected. The selected cases all showed a relative increase of bone conduction indicating some lesion of the sound-conducting apparatus located somewhere between the external canal and the perilymph. All the cases showed a rise of the low limit of tone perception.

Of the cases, one hundred and twenty-four were seen only once or twice and then passed from observation. These patients were satisfied with one or two treatments. They came for some complaint other than interstitial otitis, or were quickly relieved, or were only seen in consultation. These cases therefore were not seen enough to furnish a clinical description of the course of the ear affection.

The two hundred cases represent a proportion of one hundred and fifty cases of chronic interstitial otitis per one thousand ear cases examined. Ninety-three cases was the proportion of chronic interstitial otitis per one thousand cases examined that received no pro-

longed ear treatment. Fifty-seven cases was the proportion of chronic interstitial otitis per one thousand cases examined that received extended treatment for chronic interstitial otitis.

An analysis of the seventy-six cases that allowed more careful study gives the following data: thirty-four cases gave a typical picture of otosclerosis. The other forty-two cases had abnormalities of the tympanic membranes and tubes. Age of patients: forty were over forty years of age; thirty-six, under forty years of age; twenty-two were between forty and fifty years; twelve, between fifty and sixty years; five, between sixty and seventy years, and one between seventy and eighty years.

The cases had the following length of history of failing hearing: two cases under one year; five, between one and two years; eleven, between two and five years; nine, between five and ten years; twelve, between ten and twenty years; four, between twenty and thirty years; two, between thirty and forty years; one, between forty and fifty years; eight, "several years"; twenty-two, "many years."

The method of treatment used was intended to affect favorably the tympanic circulation. It was chiefly intranasal, sometimes constitutional tonic, occasionally local tympanic. Following are the results of treatment: hearing slightly improved, two cases; improved, forty-three cases; much improved, twenty-seven cases; considerable decrease of hearing in spite of treatment, one case; slight decrease of hearing, two cases; unchanged, one case. Total improvement, seventy-two cases, or ninety-five percent.

While the seventy-six cases were under observation, which for most of the cases has been for a period exceeding two years, the improvement brought about was maintained in all but two cases. Of the three cases that showed decrease of hearing after treatment, one was fifty-three years old and very deaf, with opaque membranes and occluded tubes; one was twenty-seven years old, and heard well with normal membranes and open tubes; one was twenty-three years old and slightly deaf, with transparent membranes and open tubes.

Long history of or degree of deafness did not affect the favorable prognosis for the beneficial results of treatment.

All the hearing tests were for air conduction.

Age,					Watch	
No. Years	History	Membrana Tympani	Tuba Auditiva	A. D.	A. S.	
1..54..	many years	opaque	open	0	0	0
2..40..	7 years	cloudy	open	0	0	0
3..46..	2 years	fairly normal	some obstruc.	2½ in.	4 in.	4 in.
4..38..	15 years	thin	open	0	0	0
5..48..	several yrs.	slight thickening	slight obstruc.	14 in.	48 in.	48 in.
6..39..	many years	calcified	open	0	0	0
7..67..	many years	white	slight obstruc.	0	0	0
8..63..	3 years	translucent	open	9 in.	22 in.	22 in.
9..24..	1 year	normal	normal	0	0	0
10..74..	many years	normal	normal	0	0	0
11..47..	18 years	normal	normal	15 in.	4 in.	4 in.
12..47..	18 months	slight thickening	closed	0	0	0
13..46..	20 years	normal	normal	0	0	0
14..35..	5 years	translucent	open	0	0	0
15..42..	2 years	translucent	slight obstruc.	10 in.	21 in.	21 in.
16..28..	4 years	normal	slight obstruc.	9 in.	11 ft.	11 ft.
17..50..	20 years	thin	open	0	0	0
18..45..	many years	thin	open	0	0	0
19..27..	3 months	thin	open	25 ft.	20 ft.	20 ft.
20..35..	many years	normal	normal	0	0	0
21..53..	many years	opaque	slight obstruc.	loud voice only	0	0
22..37..	16 years	thin	open	0	0	0
23..46..	30 years	normal	normal	½ in.	2½ in.	2½ in.
24..17..	2 years	bad translucent	closed	4 in.	5 in.	5 in.
25..50..	25 years	thin	open	0	0	0
26..36..	many years	depressed	open	0	0	0
27..38..	15 years	thin	open	0	0	0
28..41..	many years	thin	open	17 in.	0	0
29..32..	several yrs.	opaque	open	14 in.	16 in.	16 in.
30..23..	10 years	normal	normal	18 in.	5 in.	5 in.
31..24..	4 years	fair, translucent	open	0	4 in.	4 in.
32..49..	many years	thin	open	0	0	0
33..37..	1 year	translucent	slight obstruc.	54 in.	3 in.	3 in.
34..35..	4 years	white, retracted	slight obstruc.	nothing by air	0	0
35..67..	8 years	white	open	0	0	0
36..45..	12 years	translucent	open	0	0	0
37..50..	many years	translucent	slight obstruc.	14 in.	12 in.	12 in.
38..48..	a year	normal	normal	10½ in.	11 in.	11 in.
39..69..	8 years	calcified	open	0	0	0
40..37..	10 years	opaque, flat	consid. obstruc.	extremely little	16 in.	16 in.
41..50..	16 years	thickened, opaque	open	0	21 in.	21 in.
42..38..	many years	slightly opaque	open	9 in.	0	0
43..47..	34 years	flat, opaque, retract'd	closed	0	0	0
44..14..	11 years	depressed, opaque	consid. obstruc.	7½ ft.	8 in.	8 in.
45..49..	many years	opaque	open	0	0	0
46..6..	6 years	translucent	slight obstruc.	2 in.	4 in.	4 in.
47..34..	many years	translucent	open	0	0	0
48..16..	5 years	opaque, depressed	open	3 in.	3 in.	3 in.
49..41..	15 years	translucent	open	0	0	0
50..54..	45 years	white, opaque, depr'd	open	0	0	0
51..58..	many years	opaque, contracted	open	only very loud sounds close to ear	0	0
52..27..	several yrs.	translucent	slight obstruc.	9 in.	5 in.	5 in.
53..37..	many years	normal	normal	9 in.	78 in.	78 in.
54..47..	several yrs.	translucent	slight obstruc.	4 in.	2½ in.	2½ in.
55..60..	many years	translucent	open	0	0	0

No.	Hearing.					
	Pollitzer's A. D.	Acoumeter A. S.	High tone limit A. D.	Low tone limit A. D.	High tone limit A. S.	Low tone limit A. S.
1..1 in... 0.....						
2..¾ in.. ½ in.....		78000	S. V...	118 S. V....	78000 S. V.	118 S. V.
3.....						
4..6 in.. 1 in.....		46000	S. V...	156 S. V....	46000 S. V.	156 S. V.
5.....						
6..2 in.. 0.....						
7..25 in.. 7 in.....		20000	S. V...	102 S. V....	29000 S. V.	
8.....						
9..12 in.. 0.....						
10..10 ft.. 27 in.....						
11.....						
12..0..... 4 in.....		fair		poor	fair	poor.
13..5½ in.. 12 in.....		29000	S. V....		46000 S. V.	
14..3 in.. 2½ in.....		38000	S. V...	256 S. V....	38000 S. V.	256 S. V.
15.....						
16.....				above 98 S. V.		normal.
17..0-0... ½ in.....						
18..0..... 7 in.....						
19.....		normal		normal	normal	normal.
20..8 in.. 1 in.....		normal		128 S. V....	46000 S. V.	256 S. V.
21..0..... 1½ in.....						
22..0..... 0.....						
23.....						
24.....						
25..5 ft.. 40 in.....		lowered		256 S. V....	lowered	128 S. V.
26..30 in.. 1 in.....						m'ch rais'd
27..20 in.. 25 in.....		very good		much raised.	very good.	m'ch rais'd
28..... 3 in.....						
29.....						
30.....		78000	S. V....	67 S. V....	78000 S. V.	256 S. V.
31..27 ft.....		90000	S. V....	raised	90000 S. V.	raised.
32..12 in.. 4 in.....						
33.....		slightly			slightly	
		lowered...	raised		lowered.	raised.
34..nothing by air...				Paracusis of	Willis	
35..4 in.. 3 in.....		fair		256 S. V....	fair	256 S. V.
36..1 in.. 1½ in.....		26000	S. V....	raised	43000 S. V.	raised.
37.....						
38.....		41800	S. V....	67 S. V....	50000 S. V.	26 S. V.
39..7½ in.. 5½ in.....		30000	S. V....	67 S. V....	46000 S. V.	67 S. V.
40..hears extremely little						
41..23 in.....						
42.....						
43..... 0.....		2048	S. V....	1024 S. V....	4096 S. V.	512 S. V.
44.....						
45..6 in.. 4 in.....		64000	S. V....	above 36 S. V.	46000 S. V.	above 36 S. V.
46.....						
47..12 in.. 120 in.....						
48.....				raised		raised.
49..3 ft.. 7 in.....						
50..0..... 0.....		18600	S. V....	4096 S. V....	18600 S. V.	4096 S. V.
51..only very loud sounds close to ear						
52.....		44000	S. V....	well heard	39000 S. V.	well heard.
53.....		46600	S. V....	196 S. V....	54000 S. V.	normal.
54.....						
55..14 in.. 84 in.....						

No.	Treatment.	Time under treatment.	After treatment.			
			Watch.		Poltzner's Acoumet'r	
			A. D.	A. S.	A. D.	A. S.
1..nasal		3 wks... 0	0	0	72 in....	0
2..nasal		4 days.. 0	0	0	13 in....	5 in.
3..nasal		19 mos.. 3 in.	4½ in.			
4..nasal, general, local		5 wks... 0	0	0	42 in....	5 in.
5..nasal, general, local		7 days.. 60 in.	72 in.			
6..nasal		1 month. 18 in.	0	0		0
7..nasal		2 weeks. 0	0	0	5 ft....	14 ft.
8..nasal		4 mos... 48 in.	54 in.			
9..nasal		2 mos... 6 in.	0	0	8 ft....	0
10..nasal		12 days. 0	0	0	15 ft....	42 in.
11..nasal		3 years. 84 in.	48 in.			
12..nasal		12 days. 0	0	0	30 in....	24 in.
13..nasal, general		4 years. 0	0	0	9 in....	24 in.
14..nasal		8 weeks. 0	0	0	13 in....	6 in.
15..nasal		1 month. 36 in.	108 in.			
16..nasal		5 mos... 16 in.	0	0		0
17..nasal and local		2½ yrs. 0	0	0	on ma't'd	6 in.
18..nasal and local		6 mos... nothing	0	0	0	12 ft.
19..nasal, general, local		3½ yrs. 36 in.	36 in.			
20..nasal		3 mos... 0	0	0	29 in....	4 in.
21..nasal, local		3½ yrs. loud voice.	0	0	loud voice	
22..nasal, general, local		2 mos... 0	0	0	0	0
23..nasal, general		1½ mos. 5 in.	3½ in.			
24..nasal, local		1-3 yrs 23 in.	13 in.			
25..nasal		3 yrs... 36 in.	7 in.			
26..nasal		9½ mos. 0	0	0	35 in....	2 in.
27..nasal and local		6 mos... 0	0	0	54 in....	120 in.
28..nasal and local		3 mos... 38 in.	0	0		48 in.
29..nasal		2¼ yrs. 19 in.	52 in.			
30..nasal and general		1 month. 15 in.	3 in.			
31..nasal and local		10 mos.. 0	24 in.	0		
32..nasal		1½ mos. 0	0	0	8 ft....	6 ft.
33..nasal and general		11 days. 60	14 in.			
34..nasal, general, local		26 days. hears conversation				
35..nasal, local		6 mos... 0	0	0	7 ft....	4 ft.
36..nasal, local		4 mos... 0	0	0	8 in....	6 in.
37..nasal		7 days.. 16 in.	30 in.			
38..nasal		7 mos... 19 in.	18 in.			
39..nasal		2 years. 0	0	0	19 in....	10 in.
40..nasal, general, local		2 years. 0	0	0	0	0
41..nasal		5 days.. 0	60 in.			
42..nasal		2 days.. 24 in.	60 in.			
43..nasal		8 mos... 0	0	0	15 in....	27 in.
44..nasal and local		1 year.. 20 ft.	0	0		
45..nasal		15 mos.. 0	0	0	72 in....	7 in.
46..nasal		5½ mos. 10 ft.	10 ft.			
47..nasal, general		2 mos... 0	0	0	60 in....	120 in.
48..nasal		6 weeks. 3¾ in.	6 in.			
49..nasal		1 month. 0	0	0	9 ft....	54 in.
50..nasal, local		9 mos... 0	0	0	0	0
51..nasal		8 mos... ordin. voice at 4 ft.			ordin. voice at 4 ft	
52..nasal and local		3 days.. 20 ft.	10 in.			
53..nasal and general		8 mos... 18 in.	144 in.			
54..nasal		2 days.. 7 in.	6 in.			
55..nasal		3 days.. 240 in.	264 in.			

No.	High Tone Limit. A. D.	Low Tone Limit. A. D.	High Tone Limit. A. D.	Low Tone. Limit. A. S.	Remarks.
1.....					much imp. maintained.
2.....					improvement maintained.
3.....					improvement maintained.
4..54,000 S. V..			54,000 S. V..		improvement maintained.
5.....					improvement maintained.
6.....					much imp. maintained.
7.....					much imp. maintained.
8.....					much imp. maintained.
9.....					much imp. maintained.
10.....					much imp. maintained.
11.....					much imp. maintained.
12.....					much imp. maintained.
13..31,000 S. V..	128 S. V..		36,000 S. V..	113 S. V..	slight improvement.
14.....					improvement maintained.
15.....					much imp. maintained.
16.....					improvement maintained.
17.....					improvement maintained.
18.....					much imp. maintained.
19.....					considerable decrease.
20.....					improvement maintained.
21..43,200 S. V..	128 S. V..		25,200 S. V..	67 S. V..	slight decrease.
22.....					no change.
23.....					improvement maintained.
24..46,000 S. V..	128 S. V..		46,800 S. V..	256 S. V..	improvement maintained.
25..44,000 S. V..	98 S. V..		34,400 S. V..	128 S. V..	much imp. maintained.
26.....					imp., Pol. acoum. 7 ft.
27.....					much imp. maintained.
28.....					much imp. maintained.
29.....					imp. very variable.
30.....					slight decrease.
31.....					much imp. maintained.
32.....					much imp. maintained.
33.....					improvement maintained.
34..2048 S. V..	512 S. V..		4096 S. V..	512 S. V..	much imp. maintained.
35.....					much imp. maintained.
36.....					improvement maintained.
37.....					improvement maintained.
38.....					improvement maintained.
39.....					improvement maintained.
40..13,160 S. V..	6960 S. V..		13,920 S. V..	6960 S. V..	slight improvement.
41.....					improvement maintained.
42.....					much imp. maintained.
43..40,000 S. V..	268 S. V..		40,000 S. V..	256 S. V..	much imp. maintained.
44..55,600 S. V..	128 S. V..				improvement, mixed result
45.....					much imp. maintained.
46.....					much imp. maintained.
47.....					improvement maintained.
48.....					improvement maintained.
49.....					improvement maintained.
50..21,320 S. V..	4096 S. V..		19,800 S. V..	4096 S. V.*.	improvement.
51..24,000 S. V..	128 S. V..		22,000 S. V..	128 S. V..	much imp. maintained.
52.....					much imp. maintained.
53..46,000 S. V..	256 S. V..		52,000 S. V..	28 S. V..	improvement maintained.
54.....					improvement maintained.
55.....					much imp. maintained.

No. Age, Years. History	Membrana Tympani.	Tuba Auditiva.	Watch A. D. A. S.
56..55..many years...	white, flat.....	open	bone...1¼ in.
57..44..several years...	translucent	open	7 in...11 in.
58..53..many years...	translucent	open	0 in...0 in.
59..32..several years...	white, opaque	normal	72 in...2½ in.
60..55..10 years.....	translucent	open	2½ in..4 in.
61..35..2 years*.....	normal	open	17 in...3 in.
62..31..many years...	thin	occluded—one	1½ in...0 in.
63..35..6 years.....	normal	normal	0 in...0 in.
64..34..several years...	white	occluded	27 in...25 in.
65..30..many years...	thin	normal	2 in...12 in.
66..50..5 years*.....	milky	partially occluded	3 in...4 in.
67..28..20 years.....	translucent	open	2¾ in...1¾ in.
68..31..many years...	dark translucent...	obstructed	13 in...7 in.
69..49..6 weeks.....	dark, opaque	normal	3 in...8 in.
70..47..5 years.....	translucent	open	3½ in...6 in.
71..29..2 years.....	flat, gray	open	29 in...20 in.
72..40..1 year.....	gray	slightly obstructed	17 in...54 in.
73..32..10 years.....	translucent	open	1½ in...1¾ in.
74..21..several years...	flat, depressed...	occluded	12 in...0 in.
75..25..2½ years.....	translucent	occluded	10 in...12 in.
76..45..2 years.....	white	open	¼ in...1 in.

HEARING.

Politzer's		Acoumeter.	High Tone	Low Tone	High Tone	Low Tone
No.	A. D.	A. S.	Limit. A. D.	Limit. A. D.	Limit. A. S.	Limit. A. S.
56.....			40,000 S. V.	67 S. V.	42,000 S. V.	61 S. V.
57.....			34,000 S. V.	128 S. V.	25,400 S. V.	128 S. V.
58..3 in.....		in. concha...	34,000 S. V.	128 S. V.	25,400 S. V.	128 S. V.
59.....			34 S. V.		46,000 S. V.	52 S. V.
60.....			50,400 S. V.	above 134 S. V.	58,000 S. V.	above 134 SV
61.....			48,000 S. V.	174 S. V.	40,000 S. V.	134 S. V.
62.....		3 in.....	59,400 S. V.	128 S. V.	40,800 S. V.	128 S. V.
63..3 in.....		22 in.....	23,712 S. V.	8192 S. V.	38,680 S. V.	128 S. V.
64.....			48,000 S. V.	54 S. V.	45,000 S. V.	54 S. V.
65.....			40,000 S. V.	256 S. V.	46,000 S. V.	128 S. V.
66.....			21,600 S. V.	52 S. V.	38,000 S. V.	52 S. V.
67.....			46,600 S. V.	256 S. V.	42,800 S. V.	512 S. V.
68.....						
69.....						
70.....			40,300 S. V.	67 S. V.	36,660 S. V.	67 S. V.
71.....			47,000 S. V.	128 S. V.	38,600 S. V.	128 S. V.
72.....			33,840 S. V.	36 S. V.	34,600 S. V.	38 S. V.
73.....						
74.....						
75.....						
76.....						

No. Treatment.	Time under treatment.	Watch.		Poltzer's Acoumeter	
		A. D.	A. S.	A. D.	A. S.
56..nasal.....	1 month.....	1½ in.....	2½ in.....		
57..nasal, general.....	1½ months.....	13 in.....	16 in.....		
58..nasal, general.....	2 weeks.....	0.....	0.....	8 in.....	4 in.....
59..nasal.....	2 months.....	0.....	4 in.....		
60..nasal.....	5 weeks.....	4½ in.....	6½ in.....		
61..nasal, local.....	6 weeks.....	21 in.....	9 in.....		
62..nasal.....	5 weeks.....	7 in.....	0.....		9 in.....
63..nasal.....	2 months.....	0.....	0.....	7 in.....	26 in.....
64..nasal.....	2 weeks.....	7½ ft.....	10 ft.....		
65..nasal.....	5 days.....	1¾ in.....	90 in.....		
66..nasal.....	1 month.....	7 in.....	9 in.....		
67..nasal.....	2 months.....	4½ in.....	3½ in.....		
68..nasal.....	1½ months.....	48 in.....	108 in.....		
69..nasal.....	1 month.....	15 in.....	48 in.....		
70..nasal.....	1 year.....	5 in.....	9 in.....		
71..nasal.....	4 days.....	31 in.....	32 in.....		
72..nasal.....	10 days.....	108 in.....	Improved.....		
73..nasal.....	1 month.....	2½ in.....	3½ in.....		
74..nasal.....	10 months.....	30 in.....	0.....		
75..nasal and general.....	2 weeks.....	80 in.....	20 in.....		
76..nasal and general.....	1 week.....	2½ in.....	4 in.....		

No.	High Tone		Low Tone		Remarks.
	Limit.	Limit.	Limit.	Limit.	
	A. D.	A. D.	A. S.	A. S.	
56.....					Improvement maintained
57.....					Improvement maintained
58.....					Improvement, very variable
59.....			57,000 S. V.	36 S. V.	Improvement maintained
60.....					Improvement maintained
61..85,000 S. V.	128 S. V.	92,000 S. V.	128 S. V.		Improvement maintained.
62.....					Improvement maintained
63..38,880 S. V.	512 S. V.	34,340 S. V.	128 S. V.		Improvement maintained
64..44,000 S. V.	54 S. V.	46,000 S. V.	54 S. V.		much imp. maintained
65.....					Improvement maintained
66.....					Improvement maintained
67..51,600 S. V.	196 S. V.	46,000 S. V.	196 S. V.		Improvement maintained
68.....					much imp. maintained
69.....					Improvement maintained
70..43,200 S. V.		42,800 S. V.			Improvement maintained
71.....		43,000 S. V.			Improvement maintained
72.....					much imp. maintained
73.....					Improvement maintained
74.....					Improvement maintained
75.....					Improvement maintained
76.....					Improvement maintained

Conclusion. Chronic interstitial otitis includes chronic middle-ear catarrh and secondary otosclerosis. The bone lesions of secondary otosclerosis are due to diminished blood supply of the tympanic mucoperiosteum.

Clinically, otosclerosis appears to be of the secondary form. Chronic middle-ear catarrh and secondary otosclerosis yield to the same treatment independent of age, degree of deafness, or length of history.

The improvement following treatment is markedly permanent. The prognosis is good for improvement in chronic interstitial otitis.

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